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Woolbed - Sweet dreams in merino

SIFO

Consumption Research Norway

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Client Australian Wool Innovation Limited (AWI)		
Sammendrag Vi har undersøkt mulighetene for å gjeninnføre ull som sengetekstil. Barrierer for bruk av ull i nattøy og sengetøy blant norske og svenske forbrukere er analysert basert på web survey, intervjuer der informan- tene også kjente på en rekke ulike stoffer, og en brukertest av sengetøy og nattøy i ull. Muligheten for et sengetøy i ull ble møtt med positiv nysgjerrighet av de aller fleste informanter. Et viktig funn er koblet til hvordan endring finner sted. I Norge er bruken av ull, og da spesielt på mindre barn og i forbindelse med utendørsaktiviteter om vinteren en norm, en standard forbrukeren bevisst må velge bort. I Sverige derimot er valget av ull, nettopp et valg noen gjør og da ofte med en sterkere ideologisk begrunnelse. Markedet for kroppsnær ull vokser i Sverige og forskjellene mellom de to land kan dermed forventes å minke. Barrierer knyttet til hygiene, varmeregulering, struktur og mykhet er viktige i forbrukernes tanker omkring ull som sengetekstil. De har lite erfaringer med tynnere vevde stoffer og vanskeligere for både å gjenkjenne slike stoffer som ull og se for seg hvordan de vil virke i bruk.		
Summary We have studied Norwegian and Swedish consumers' experiences and perceptions related to using wool in bedlinen and sleepwear. We have used a variety of research methods including a web-based survey, qualitative interviews, a material test where informants commented various fabric samples, as well as user trials where informants tested sleeping in merino bedlinen and sleepwear. Informants were positively curious about bedding in wool. It appears that the change in use of wool follows a pattern where one context or setting is used as a springboard into a new setting. Important springboards among informants are; dressing their own babies in wool, next to skin underwear in sports, and tradition and handicrafts related to wool. Differences between Norway and Sweden are apparent in a different relationship to wool and to bedlinen. The market for woollen underwear is growing in Sweden and the differences between the two countries can thus be expected to decrease. Barriers related to hygiene, heat regulation, structure and softness are important in consumers' thoughts about a wool-bed.		
Stikkord Ull, søvn, merino, sengetøy, nattøy, seng, intervjuer, brukerundersøkelse		
Keywords Wool, sleep, merino, bedlinen, nightwear, bed, interviews, user trial		

Woolbed

Sweet dreams in merino

by

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Preface

This report is part of project “Woolbed - Sweet dreams in merino” that was commissioned by Australian Wool Innovation Limited (AWI) and financed as a part of their Fibre Advocacy strategy.

The research was conducted and the report was written by project leader Ingun Grimstad Klepp and Kirsi Laitala from Consumer Research Norway SIFO, and Tone Skårdal Tobiasson from NICE (Nordic Initiative Clean & Ethical). The project partners Aclima AS and Lindholm Pure have contributed in planning the project as well as with the woollen products used in the execution of the project.

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Summary

Wool is understood in a variety of ways that are both related to the properties of the fibres and the garments made from the fibre, and how these are understood in the relationship between the body and clothes, and between people in both a contemporary and historical perspective. The understanding of wool is characterized by both tradition and culture through coarser knits and home production, as well as a newer merino-based wool use where sports and toddler apparel are central.

We have studied Norwegian and Swedish consumers' experiences and perceptions related to using wool in bedlinen and sleepwear. We have used a variety of research methods including a web-based survey, qualitative interviews, a material test where informants were shown various fabric samples for comments, as well as user trials where informants tested sleeping in merino bedlinen and sleepwear. As there is no English word for all the many textiles in use in a bed, we will introduce 'wool-bed' which will cover sheets, duvet-covers, pillow-cases and night-wear such as pyjamas, a night-gown etc. All the wool textiles in a bed in contact with the skin can be understood as 'wool-bed'. We use this expression sometimes in the report, but other times we differentiate the bedding from nightwear.

Knowledge about wool and other textile fibres varies. Many people confuse raw materials with the weave. Expressions used vary between names of weaving techniques, fibre and fabric appearance. With this in mind, it is surprising that the knowledge of wool's technical characteristics is rather good. But the characteristics that are emphasized, are limited. These are particularly wool's ability to warm, to absorb moisture and to reduce smell. There is less emphasis on properties in relation to flammability, the fibre's ability for permanence of shape, the ability to felt or the fact that wool creases less. Itching is not perceived as a major barrier, but something that belongs to the past. Warmth is the

biggest argument against using wool. Many have heard that wool regulates temperature, and that wool therefore may be used even when it is hot. However, respondents are sceptical to this and few have changed their own practice by using wool in warm weather or for indoor activities. The understanding of wool as warm is therefore both an argument for and against the use of wool. The same can be said about hygiene. Those who use a lot of wool appreciate wool's ability to stay clean and specifically that it does not smell sweat even after several workouts or long use. On the other hand, it is an established understanding that it is the water-temperature that determinates the cleanliness of laundry, and that wool cannot tolerate heat. Thus also hygiene is an argument against wool underwear and bedding.

It is particularly briefs and boxers informants believe 'need' high temperatures in order to get clean. The knowledge of wool's advantages in relation to practical dressing, is frequently summed up in the phrase 'wool under' or 'wool next to skin', especially in Norway. This suggests that the innermost layer of wool is most important for a flexible and warm way of dressing, specifically in changes between activity and rest. Wool next to skin is also important in the attire of babies and toddlers in Norway. Despite this, cotton panties and boxers are used under woollen long-johns, not by babies, but by toddlers and adults. This practice is not perceived as illogical. It is linked to an understanding of cotton as a 'hygienic fibre'. That cotton needs to be washed often and with high agitation to become clean, is confused with cotton as something clean.

The washing frequency of woollen underwear varies: Some launder after every use while others wash once a year. Laundering in Norway is far more standardized than laundering in Sweden, and it is common to use the wool/silk wash program along with Milo (the market-leading wool wash detergent). In Sweden, they use wool detergents less frequently, wash more by hand, and there is more variety. Several Swedish informants try to avoid 'super-wash' treated wool and believe that this treatment destroys wool's characteristics. Those who have and use a lot of wool find it easier to keep the wool clean compared to other materials. Informants who use less wool report more cumbersome care-practices. This is due not just to a lack of knowledge but also a lack of procedures, as well as the problem of 'filling up' a machine.

Based on the informants' stories about changes in their own wool use, it appears that the change follows a pattern. The use of wool in one context or setting is used as a springboard into a new setting. The change thus happens gradually and good experiences work in tandem with external influences to induce the change. Important springboards among informants are; attire for their own ba-

bies and toddlers in wool, next to skin underwear in sports, tradition and handcrafts related to wool, including knitting. Important for the 'steps' taken are influences from people they trust. The largest increase in usage is however due to an area of use becoming the norm. Thus the choice does not appear as a choice, but is what you do unconsciously. This normalization is found in traditional wool use, such as with mittens, hats and all that could easily have been hand knitted. In Norway, the use of a next to skin merino comes in addition to the standard use for babies and toddlers. Following this line of logic, Norway has several areas where change could happen. Important for change is also availability in general and the availability of high-quality products. Several informants were not aware of light woollens such as briefs and boxers, or the range of singlets and short-sleeved t-shirts that are available from sports and leisure brands. Awareness of long-sleeved underwear and long-johns, on the other hand, was very good. Lightweight garments for daily use was something many had not seen or used. Important obstacles to an increased use of merino was accordingly better availability of attractive products (outside sports) and the idea that wool is something that is used when it is necessary for the clothing to provide extra heat.

A pleasant temperature is important in order to sleep well. Most of the informants believed that a cold bedroom and warm duvet solves this, as well as being the healthiest. The wide variation in bedroom temperature was solved by having different duvet-thicknesses, or different bedding for winter and summer. If space allowed, the bedroom was used very little during the day, and was shut off, cool and empty. The bedroom is not a high priority and it is not a part of the house that is opened up to guests.

Many of our informants slept naked or in boxers/panties. This is also found in our online survey. Sleepwear is something several, especially men, ceased to own and use they grow up. When they slept away from home, or had small children who came into their beds at night, they wore nightwear. Nightwear is not perceived as a good way to regulate the temperature at night, but was used more to cover the body. Some informants used sleepwear, also during the day as lounge-wear.

Cotton was the dominant material in nightwear and in bedding. Cotton was not specifically chosen, but was not consciously avoided either. Some had attempted to sleep in and/or obtain other materials. In Sweden, linen is an alternative and silk was also a possibility mentioned. Synthetic bedlinen or bedlinen blends with synthetic fibres were perceived as rather impossible to sleep in. Many also perceived cotton as clammier than they preferred. There were few

declarations of 'love' for cotton. Bedlinen was, however, not a high priority among the majority of our informants.

The bedding was reported changed varying from weekly to monthly, However, this can also be perceived as an ideal the informants tried to live by. In practice, it is easy to downgrade because the practice does not affect others than themselves, and because changing the bedding is perceived as laborious.

In relation to a market where wool bed textiles are virtually absent, informants have rather surprisingly extensive experience sleeping in wool. Wool underwear was used as sleepwear at cabins and in connection with the outdoors activities, and at home if one was sick or cold. When woollen sleepwear was chosen, it was to get extra warmth, which thus matches the understanding of wool as purveyor of warmth. No one had negative experiences with sleeping in wool underwear. For the bed a wool blanket was often used. There were many different ways to use a blanket. The most common was to have it on the top of the covers, or available near the bed if needed for extra warmth. But there were also several who had used blankets inside the duvet cover as a summer duvet. Blankets were also used to sleep on and as a duvet without duvet covers or under another duvets. The choice of wool in the bed was related to the desire of both more and less warmth and to the desire for a bedding that regulated temperature better. Blankets could also be used as a replacement when other bedding was missing.

Informants were very curious about bedding in wool. Everybody wanted to try. The objections against such bedlinen were primarily that it would be too hot. One reason for the wish to try, was that lack of satisfaction with the bedding they already had. This was primarily due to the inability to 'breathe' or regulate heat, but even cleanliness was an issue for some. The informants were less curious about wool sleepwear, which was natural in view of owning little nightwear and more experience in sleeping in wool underwear.

Much of the bedding the informants owned had been bought at a low price-point or received as gifts. Purchase price for the last purchase ranged from NOK/SKK 100 to 800 for a set of pillowcase and duvet cover. As a starting point for the discussions on how much they would be willing to pay for a possible bed-set in wool, we used NOK/SKK 2500, 3200 or 4000. Those informants who would accept a high price-point, did so based on a perception of wool being an expensive commodity, and that such a bed set would be an long-term investment. Several thought the prerequisite for spending a large sum, was that the product had additional values such as good documentation of properties, animal welfare, country of origin and eco-credentials. Having actually tested

sleeping in wool bedding, is perceived as a prerequisite by the majority in order to invest in bedding at such a high price-point. For several of the informants such a high price-point is unacceptable irrelevant to the bedding's quality. The reasoning is both that bedlinen is not of importance to them, and that they do not have disposable income to spend. That said, there is not a direct correlation between spending power and spending-willingness. The understanding of bedlinen as important and wool bedding as better than other options for sleep quality, are equally crucial. This offers a potential for a market in a luxury segment, but the up-take in such a market (e.g. high end winter resorts) would need closer examination.

Differences between Norway and Sweden are apparent both in different relationship to wool and to bedlinen, and in the informants' answers to direct questions on the subject. Many were unsure whether there was any difference in the wool use for the two neighbouring countries. Those who had more in-depth knowledge of both countries were also the ones who believed the differences to be the greatest. Swedes who wanted to use a lot of wool, sought Norwegian brands. The picture that emerged of differences and reasons for these, had more commonalities. Norway and Sweden have taken different historic routes and this has resulted in varied apparel use relative to national heritage, formal wear and outdoor activity. In Norway, national costumes and knit patterns are an important part of the national identity. Swedes perceive Norwegians as both more traditional and more nationalistic than themselves. More extensive use of wool in Norway is related to both the tradition with knitwear, national costumes and hand knitting, but also to skiing, winter and cabin life. However, the Norwegian use of woollen attire for toddlers, is only described by Norwegians and those we would define as wool-lovers in Sweden. This difference is probably the greatest because it is not only a difference in quantity, but even in what is considered the 'natural' choice, and may thus be perceived as a clothing norm in line with cotton bed textiles.

The material test showed that the informants did not think they would have anything against merino as bed textiles. They did not think that samples with lower than 20 microns itched. On the other hand, they did not want to have synthetic materials in their bed, not even as blends and many are also wary of silk and viscose blends. Surprisingly, many people perceived that a thin cotton weave was unsuitable as bedding and likewise a cotton polyester blend. The materials preferred for nightwear were woollen fabrics with low microns and in a single jersey-knit. A woven canvas in thin merino was the bedlinen that was most preferred.

The results of the user test was surprising when compared to the interviews and the material test. What the informants thought would be a primary problem - heat - proved not to be. On the other hand, most experienced the bedding as itchy. This was something they had not even considered, when feeling and touching the same or similar materials in the material test.

The web-based survey shows that the consumers that responded to the web-survey do not differ significantly from the informants, but they have not been interviewed; either because they did not want it, or because we chose not to. The difference between Norwegian and Swedish respondents to the web-survey is small in terms of when wool is used. But there are fewer Norwegian informants who do not use wool underwear compared to the Swedes. On the other hand, more of the Swedes have experience using wool bedding or blankets and several of the Swedish respondents had searched for wool bedding. Hand-washing wool is far more common in Sweden than in Norway.

Sammendrag

Ull forstås på en rekke ulike måter som både er knyttet til egenskapene fibrene og plaggene av ullen har, og til hvordan disse inngår i relasjoner mellom kroppen og klærne og mellom mennesker både i samtiden og historisk. Forståelsen av ull er preget av tradisjon og kultur med grovere strikkeplagg og hjemmeproduksjon men også en nyere merinobasert ull-bruk der sport og småbarns-påkledning står sentralt.

Vi her studert norske og svenske forbrukeres erfaringer og oppfatninger rundt bruk av ull i sengetøy og nattøy. Vi har anvendt flere forskningsmetoder inkludert en web-basert survey, kvalitative intervjuer, en test med materialprøver som informantene tok på og kommenterte, i tillegg til bruker-tester hvor informantene sov i merino sengetøy og nattøy. Siden det ikke finnes noe engelsk ord for 'sengetøy' som på norsk dekker laken, dynetrekk, putetrekk og nattøy som pyjamas og nattkjoler, osv; introduserer vi begrepet 'wool-bed' eller 'ull-seng'. Noen ganger forekommer begrepet i rapporten, andre ganger differensierer vi sengetøyet fra nattøyet.

Kunnskap omkring ull og andre tekstilfibre varierer. Mange forveksler råmaterialer med vev-bindinger. Benevninger glir mellom navn på vevteknikker, fibre og stoffers utseende. Kunnskapen om ullens tekniske egenskaper er, spesielt tatt dette i betraktning overaskende god. Men det er særlig noen av egenskapene som blir lagt vekt på. Dette er særlig evnen til å varme, trekke til seg fuktighet og lukte lite. Mindre vekt blir lagt på egenskaper i forhold til brann, evnen til å gis permanent ny form, tove eller at den krøller lite. Kløe oppfattes ikke som noe stort problem, men noe som tilhører fortiden. Varme derimot er det største argumentet mot å bruke ull. Flere har hørt at ull regulerer varme, og at ull dermed også kan brukes når det er varmt. Men de stiller seg litt tvilende til dette og har i liten grad omsatt det i egen praksis. Forståelsen av ull som varmt er dermed både et argument for og mot å bruke ull. Det samme kan sies om hygiene. De som bruker mye ull er begeistret for ullens evne til å holde seg ren og

spesielt at den ikke lukter svette etter gjentatte treningsøkter og lang bruk. På den annen side er det en innarbeidet forestilling at det er temperaturen i vasken som tilsier hvor ren vasken blir og at ull ikke tåler varme. Dermed blir også hygiene et argument mot ull som undertøy eller sengetøy.

Det er særlig truser og boxere informantene mener 'trenger' høye temperaturer for å bli rene. Kunnskapen om ullens fordeler i forhold til bekledning samles ofte opp i uttrykket 'ull innerst', spesielt i Norge. Dette tilsier at det innerste laget av ull er viktigst for en fleksibel og varm påkledning spesielt i vekslinger mellom aktivitet og hvile. Ull innerst er viktig i påkledning av spe- og småbarn i Norge. Til tross for dette brukes det truser og boxere i bomull under ullundertøyet, ikke på babyer, men på mindre barn og voksne. Denne praksisen oppfattes ikke som ulogisk. Den er knyttet til en forståelse av bomull som en «hygienisk fibre». At bomull må vaskes ofte og hardt for å bli rent forveksles med at bomull er lik renhet.

Det er meget store forskjeller på hvor ofte ullundertøy vaskes. Noen vasker det etter hver gangs bruk mens andre vasker det en gang i året. Vasken i Norge er langt mer standardisert. Her gjelder ullvaskeprogram og Milo. I Sverige er det mindre bruk av ullvaskemiddel, og mer bruk av håndvask og også mer variasjon. Flere av de svenske informantene forsøker å unngå 'super-wash' behandling ull og forestiller seg at denne behandlingen ødelegger ullens egenskaper. De som har og bruker mye ull synes det er lettere å holde ull rent enn andre tekstiler. Mens personer som bruker mindre har større problemer. Dette skyldes ikke bare kunnskap, men også rutiner og problemet med å 'fylle opp' en maskin.

Ut i fra informantenes fortelling om endringer i egen ull-bruk synes det som om endring følger et mønster. Dette er at bruken av ull innenfor en kontekst eller sammenheng brukes som springbrett over i en ny sammenheng. Dermed går endringen skrittvis og det er gode erfaringer og opplevelser sammen med en ytre påvirkning som bidrar til at skrittet tas. Viktige springbrett blant informantene er; påkledning av egne spe- og småbarn i ull, kroppsnaert ullundertøy i sport, tradisjon og håndverk i ull samt strikking. Viktige for at «skritt» tas er påvirkning fra andre mennesker som står en nær. Det største økningen i bruken er likevel når et nytt felt blir det normale. Altså at valget ikke fremstår som et valg, men er det man gjør om man ikke bevisst velger noe annet. Denne normaliseringen finner vi i tradisjonell ull-bruk innenfor votter, luer og alt som er – eller kunne ha vært strikket hjemme. I Norge har bruken av kroppsnaert merino kommet i tillegg som det normale for spe- og småbarn. Dermed har vi i Norge flere felter der endring til mer bruk kan ta utgangspunkt i. Viktig for endring er også tilgjengelige og gode produkter. Flere av informantene kjente ikke til lette, små ullplagg som truser og boxere eller utvalget av singletter og kort-ermete t-

skjorter. Kjennskapen til langermede og langbente sportsundertøysett var derimot svært god. Lette plagg for daglig bruk var heller ikke noe mange hadde sett og brukt. Viktige hindringer for økt bruk av merino var dermed bedre tilgjengelighet av attraktive produkter (utover sport) og forestillingene om at ull er noe som brukes når det er nødvendig at klærne gir ekstra varme.

Temperatur er viktig for å sove godt. De fleste av informantene mente at kaldt soverom og varm dyne var det som var best og sunnest å sove i. Den store variasjonen i soverommets temperatur ble løst gjennom å ha ulik tykkelse på dynen, eller ulikt sengetøy vinter og sommer. Dersom det er praktisk mulig ble soverommet brukt svært lite om dagen, men sto avstengt, kjølig og ubrukt. Rommet er ikke høyt prioritert og er heller ikke den delen av boligen som vanligvis vises til gjester.

Mange av våre informanter sov nakne eller i boxer/truse. Dette stemmer også med resultatene fra surveyen. Egnede nattøy er noe som flere, og da spesielt menn sluttet å ha og bruke som barn. Når de sov borte hos andre, eller hadde småbarn som kom i sengen ble nattøy brukt. Nattøy oppfattes av mange ikke som noen god måte å regulere temperaturen om natten, men ble mer brukt for å skjule kroppen. Noen av informantene hadde og brukte nattøy til daglig.

Bomull var helt dominerende både i det nattøyet som ble brukt og i sengetøyet. Bomull ble ikke valgt, men heller ikke valgt bort. Enkelte hadde riktignok forsøkt å sove i og/eller skaffe andre materialer. I Sverige var lin et alternativ og silke var også en mulighet. Syntetisk sengetøy eller sengetøy i blandinger med syntetiske fibre ble oppfattet som HELT umulig å sove i av alle informanter i begge land. Og mange mente også at bomull var mer klamt enn de ønsket. Det var få kjærlighetserklæringer til bomull. Sengetøy var ikke høyt prioritert blant de fleste.

Sengetøyet ble skiftet mellom hver uke og en gang i måneden, men dette kan også oppfattes som idealer informantene forsøkte å leve etter. I praksis er det lett å nedprioritere fordi det ikke går ut over andre enn dem selv, og fordi det oppfattes som arbeidskrevende.

I forhold til et marked der ull som sengetekstil nærmest er fraværende har informantene mye erfaringer med å sove i ull. Ullundertøy ble brukt som nattøy på hytter og i forbindelse med friluftsliv og hjemme om man var syk og frossen. Når nattøy velges er det nettopp for å få ekstra varme, noe som da passer overens med forståelsen av ull. Det var ingen som hadde dårlige erfaringer med å sove i ullundertøy. I sengen var det ullteppe som ble brukt. Det var mange ulike måter å bruke teppet. Det vanligste var å ha den oppå dynen, eller tilgjengelig i

nærheten av sengen dersom behov for ekstra varme skulle melde seg. Men det var også flere som hadde brukt ullteppe inne i dynetrekke som sommerdyne. Ulltepper ble også brukt til å sove på og som dyne uten dynetrekke eller under annen dyne. Valget av ull i sengen var knyttet til ønske om både mer og mindre varme og til ønske om et sengetøy som regulerte varmen bedre. Pledd ble også brukt som en erstatning for annet sengetøy når annet sengetøy manglet.

Informantene var veldig nysgjerrige på et sengesett i ull. Alle ønsket å prøve det. Motforestillingene mot et slikt sengetøy var først og fremst at det ville være for varmt. En grunn til å ønske ullsengetøy var at de var lite fornøyde med det sengetøyet de hadde. Denne misnøyen var først og fremst grunnet i sengetøyets manglende evne til å 'puste' og regulere varme, men også i enkelte tilfeller om renhold. Informanten var minste nysgjerrige på ullnattøy, noe som var naturlig i og med at de både brukte lite nattøy og hadde mer erfaring i å sove i ullunder-tøy.

Mye av det sengetøyet informantene hadde var kjøpt billig eller gitt som gaver. Innkjøpspris for siste kjøp varierte fra 100 NOK/SKK til 800 NOK/SKK et sett med putevar og dynetrekke. Betalingsvilligheten for et mulig sengesett i ull ble diskutert med utgangspunkt i prisene 2500, 3200 eller 4000 for et sett. De som kunne tenke seg å akseptere en slik pris gjorde det ut i fra at ull er en dyrere råvare og at et slikt sengesett ville være en investering som varte lenge. Flere mente at forutsetningen for å bruke en slik sum var at produktet hadde tilleggs-verdier slik som god dokumentasjon av egenskaper, dyrevelferd, opprinnelses-land og miljø. Å ha prøvd selv hvordan det er å sove i ull oppfattes av mange som en forutsetning for å velge å investere i sengetøy i en slik prisklasse. For en del informanter er en slik pris uaktuell uavhengig av sengetøyets kvalitet. Årsaken er både at sengetøy i seg selv ikke er noe viktig for dem, og at de ikke har penger som kan prioriteres til dette. Når det er sagt er det ikke en enkel sammenheng mellom god råd og stor betalingsvillighet. Forståelsen av senge-tøy som viktig og ullsengetøy som bedre enn andre alternativer er vel så avgjø-rende.

Forskjeller mellom Norge og Sverige kommer frem i rapporten både i ulikheter i forholdet til ull og sengeklær og gjennom det informantene svarer på spørsmål direkte om dette spørsmål. Mange var usikre på om det var noen forskjell på ullbruken i de to naboland. De som hadde erfaring fra begge land var de som også mente forskjellen var størst. For svensker som har ønsket å bruke mye ull har Norge fungert som et marked. Det bildet som ble tegnet av forskjellene og årsaken til dem hadde flere fellestrekk. Norsk og svenske historie er forskjellig noe som også har ført til klærs ulike posisjon i forhold til det nasjonale. I Norge

er bunader og strikkemønster en viktig del av nasjonal identitet. Svensken oppfatter nordmenn som både mer tradisjonelle og mer nasjonale enn dem selv. Mer bruk av ull i Norge knyttet både til det tradisjonelle med strikkeplagg, bunader og håndstriking, men også til ski vintersport og hytteliv. Men påkledningen av småbarn i ull i Norge trekkes bare frem at nordmenn og ullelskere i Sverige. Denne forskjellen er trolig den som er størst fordi den ikke bare er en forskjell i mengde, men en forskjell i hva som anses som det naturlige valget og kan dermed oppfattes som en klesnorm på linje med bomull som sengetekstil. Forskjellene mellom landene er i ferd med å bli mindre fordi bruken av ull øker i Sverige.

Materialtesten viser at informantene ikke trodde de ville ha noe imot merino som sengetekstil. De mener ikke at prøver med lavere enn 20 mikron klør. Derimot ønsker de ikke å ha syntetiske materialer i sengen, ikke en gang i blandinger og mange er skeptiske også til silke og viskose. Overraskende mente mange at en tynn bomullsvev var uegnet som sengetekstil og likedan med en bomull polyesterblanding. De stoffene som ble foretrukket til nattøy var ullstoffer med lav mikron og i enkel jersey. Til sengetøy var det lerretsvevet tynn merino som ble foretrukket av de fleste.

Resultatene fra brukertesten var overraskende sett i forhold til intervjuer og materialtest. Det informantene trodde skulle være mest problematisk – varme - viste seg å ikke være det. På den annen side opplevde de fleste at sengetøyet klødde. Dette var noe de ikke trodde ville skje, heller ikke når de kjente på samme eller tilsvarende stoffer i materialtesten.

Web surveyen viser at våre informanter skiller seg ikke så mye ut fra de andre som svarte på undersøkelsen, men som ikke er intervjuet enten fordi de ikke ønsket det, eller fordi vi ikke valgte dem ut. Forskjellen på norske og svenske informanter er liten når det gjelder når ull brukes. Men det er færre norske informanter som ikke bruker ullundertøy i forhold til svenske. På den annen side er det flere av de svenske som har erfaring med bruk av ullsengetøy eller tepper og flere av de svenske informantene som ønsker seg ullsengetøy. Håndvask av ull er langt mer vanlig i Sverige enn i Norge.

Norsk konklusjon

Prosjektets hovedmål har vært å undersøke barrierer for å gjeninnføre ull som sengetekstil. Vi har også ønsket å se på om barrierene er like for ulike aldre, for nattøy og sengetøy, for Norge og Sverige, og i ulike brukskontekster. Vi skal nå undersøke disse spørsmålene nærmere, samt trekke frem noen andre viktige funn i materialet som har implikasjoner for en slik overgang.

Muligheten for et sengetøy i ull ble møtt med positiv nysgjerrighet av de aller fleste informanter. De stilte seg ikke negative til at sengetøy kan være i ull. Dette er et vesentlig funn både i intervjuer, materialtest og utprøvingen av produkter. Mest positive er de som allerede har mye erfaring med kroppsnær merino (undertøy og småbarns-tøy). I forhold til utvikling og markedsføring av sengetøy er det viktig at produktet nettopp møter denne positive nysgjerrighet.

Nattøy i ull vekker ikke like stor nysgjerrighet, men på den annen side har flere erfaringer med å sove i ullundertøy. Overgangen fra bomull til ull som nattøy er dermed mye mindre. I Norge synes spebarn og småbarns nattøy i ull å være normalisert. Nattøy er også, mer enn vi forutsatte, noe som forbindes nettopp med barn. Informantene selv sov oftere nakne, eller i ulike former for undertøy. Økning i bruken av ull som nattøy kan dermed også fremmes gjennom markedsføring av ullundertøyets fleksibilitet som både natt- og dag-påkledning, og ikke bare gjennom egne kolleksjoner forbehold natten.

Viktige barrierer

Den viktigste barrieren for endring mot bruk av ull er en generell nedprioritering av hele forbruksfeltet. Få hadde et aktivt og bevisst forhold til hva slags sengetekstiler de ønsket, selv om noen også satte stor pris på god kvalitet og hadde skaffet seg sengesett i lin og silke eller ønsket seg ull. Mye ble kjøpt billig eller ble mottatt som gaver. Denne lave prioriteringen av nattens tekstiler kan skyldes at valgmulighetene faktisk er begrenset og at det dermed heller ikke oppfattes som noe viktig valg. Men en annen mulighet er at forbruksfeltet er mer knyttet opp mot aktiviteter, sosialt liv og ansikt utad og fremstår som viktigere enn forbruket bak soverommets stengte dør.

En viktig metodisk kommentar i forhold til den lave prioriteringen av sengetekstiler er utvalget av informanter. Våre informanter var relativt unge og friske. En gruppe med større helseproblemer kunne ha prioritert annerledes. Informantene rapporterte ikke store søvnproblemer, men de erfarte likevel at temperatur var viktig for søvnkvalitet. En gruppe med større søvnproblemer ville nok også være mer opptatt av forbedringspotensialet.

Den neste største barrieren er forståelsen av ull som *varmt*. Riktignok er dette noe som taler både for og mot ull i sengen, men mange er redd at ull vil være for varmt. For å imøtegå dette er det vesentlig å legge vekt på ullens temperaturregulerende egenskaper, fremfor de varmende. Mange hadde hørt om dette, men klarte likevel ikke å tro helt på det eller relatere det til sin egen ull-bruk. For enkelte er dyrevelferd avgjørende i sammenheng med valg av ull generelt eller merino spesielt.

Forståelsen av hygiene har mye til felles med forståelsen av varme. Også her har informantene kunnskaper, men ikke helt tillit til denne. Dette resulterer i hyppigere vask enn det som hadde vært optimalt spesielt hos de som bruker ull lite. Akkurat dette tilsier at vaskehyppigheten vil gå ned med økt bruk av ull. Hygiene er trolig en større barriere mot økt bruk av ullundertøy, spesielt truser. Årsaken til, og virkemidler til å imøtegå dette er derimot trolig det samme. Vi trenger bedre dokumentasjon av forholdet mellom fibre, temperatur og renhet både forstått som fravær av lukt, flekker og uønskede mikroorganismer.

Ull forbindes med strikkede strukturer og ikke vevde. Dette er både en utfordring og en mulighet. Mange blir overrasket over at de tynne vevde stoffene i merino er ull. Selve overraskelsen trigger nysgjerrigheten, men det at stoffet i seg selv ikke oppfattes som ull kan være en barriere og da både ved anskaffelse og ved vask/bruk.

Mens informantene gjennomgående var mer nysgjerrige på ullsengetøy enn på nattøy i ull viser erfaringene fra de 10 som testet å sove i ullundertøy og ullsengetøy en motsatt tendens. De var overraskende positive til å sove i ullundertøy. Sengetøyet derimot ble ikke oppfattet så mykt og behagelig mot huden som de hadde forestilt seg. Dette er overraskende fordi det samme tekstilene ble vurdert som myke nok å ha mot huden i materialtesten. Overraskende var også at mens kløe ikke ble ansett som en stor barriere i intervjuene, var mange opp-tatt av ullsengetøy ville bli for varmt. I brukertesten derimot var tilbakemeldingene på kløe negative mens temperaturreguleringen meget positiv. Sengetøyet ble ikke oppfattet som varmt i noen negativ forstand og hadde den forventede evnen til å regulere temperatur og fuktighet.

I det videre arbeidet med ullsengetøy er det viktig å forstå kløe bedre. Hvorfor opplevde en del av våre informanter undertøyet som mykt og behagelig, mens det vevde sengetøyet som grovt og ubehagelig mot huden? Er det utvalget av informanter som er spesielt? Er opplevelsen av vevde kvaliteter mer ny og uvant og derfor mindre behagelig? Var stoffet rett og slett ikke 'mykt' nok til å sove i? Bør sengetøy lages i strikkede kvaliteter? Finnes det andre vevde stoffer som som ville egne seg bedre? Dette er noen av de spørsmålene dette reiser.

Hvem vil elske en ullseng

Dedikerte ullelskere har ikke noen barrierer mot å bytte til ullsengetøy. Når de ikke allerede har det i hus, er det fordi det ikke finnes på markedet. I og med at det er flere som har god erfaring med kroppsnær merino i Norge enn i Sverige er dette trolig også der barrierene er minst. Samtidig finnes det veldig dedikerte 'ullelskere' i Sverige som er vant til å måtte gjøre en større innsats, og betale

en høyere pris for å få tak i produkter de ønsker. I Sverige er det en større jobb som trengs med opplæring i riktig stell og bruk enn det er i Norge.

Norske småbarnsforeldre er den gruppen som bruker mest merino og der ullbruken i størst grad oppfattes som en norm, eller det naturlige valget. Det tilsier at sengetøy for småbarn ville være et kort steg for denne gruppen.

Det er påfallende mer bruk av ull i senger på hytter enn hjemme. Dette skyldes at hytta er kald når man kommer dit, og at det tar tid å få varme i sengene, og bli kvitt rå fuktighet. Sengene kan dermed være klamme med bomullstekstiler. Men også andre forhold spiller inn. Ull hører hjemme der fordi det oppfattes som naturlig, tradisjonelt og varmt, og fordi klesnormer tones ned. Hyttefolk vil dermed trolig elske ullsengetøy og ikke minst nattøy eller en kombinasjon av dag og natt innetøy.

Personer med problemer med søvn og temperaturregulering, og/eller som tilbringer mye tid i sengen: Vi har sett at det som finnes av sengetøy i ull nettopp er rettet mot et marked mot eldre og syke (Klepp, Tobiasson & Laitala, 2015). En annen interessant gruppe som har problemer med søvn og temperatur er kvinner i overgangsalderen. Fordelen med denne gruppen (i Norge) er også at de etter hvert har mye erfaring med kroppsnær merino gjennom egne småbarn og er 'midt i livet' og vil dermed kunne bli en stabil kundegruppe over tid.

Til slutt vil vi tro at forståelsen av ull som kvalitet og ekte vil utgjøre en mulighet for kvalitetsbevisste og 'kresne' kunder. Dette er de som generelt ønsker 'det beste' og ikke oppfatter høy pris som et problem, men et tegn på at produktet er av rette sorten og i riktig kvalitet. For denne gruppen vil design, innpakking og et helhetlig produkt der alt er på stell fra dyrevelferd til søm, være viktig.

Noen viktige muligheter

Prøve selv

Nysgjerrigheten, og usikkerheten rundt ull som sengetekstil tilsier at det å la mulig kunder prøve sengetøyet vil være en god idé. Det kunne utvikles som en type tjeneste der det var mulig å leie sengetøyet for en periode og så kjøpe til redusert pris. Fremveksten av nye business modeller vil kunne styrke en slik modell. Vi har allerede gode tradisjoner for flere brukere av tøy for gravide, sengetøy for overgangsalderen vil kunne være et alternativ. De hygieniske sidene av dette vil selvsagt måtte ivaretas, men vi har allerede deling av sengetøy både privat (gjester) og offentlig (sykehus, hotell, med mer) selv om deling av ullsengetøy reiser en del andre spørsmål.

Småbarn i våte senger

Mange barn er sengevætere langt oppover i skoleårene. Dette er dermed barn som ikke sover i babysenger, men i sengetøy med normale dimensjoner. Både evnen til å varme ved fukting, og lav luktutvikling tilsier at sengetøy av ull vil være en god ting for denne gruppen. Bruk av ullsengetøy vil også kunne få ned vaskehyppheten.

Hytte

Hytteeiere er allerede nevnt som en mulig kundegruppe for ullsengetøy og natttøy. Det spesielle ved hyttene er vekslingen mellom varmt og kaldt som kan skape fuktproblemer. Hytter og hytteliv har også en del andre særtrekk som utgjør muligheter for ullprodukter. Dette omfatter både idealer i sammenheng med aktivitet, estetikk, materialer og forholdet til natur og naturlighet

Midd

Ønske om en seng med mindre midd er det flere som har, men løsningene derimot oppfattes som arbeidskrevende. En undersøkelse omkring midd i ulike typer tekstiler ville være interessant. Dersom ull viste seg å ha lavere innhold av midd ville dette være et meget viktig argument for sengetøy av ull.

Skifte på sengen

Alle liker rent sengetøy, mens det å skifte på sengen er slitsomt og tidkrevende. At sengen holder seg ren og frisk lenger vil dermed være et vesentlig argument for overgang til ull-seng.

Miljø

Forbrukere har (enda) ikke fått med seg at ull kommer dårlig ut i de internasjonale verktøy for sammenligning av fibres miljøbelastning. Derimot har mange fått med seg at bomull er en miljøversting. Det tilsier et handlingsrom for å endre vilkårene for sammenligning. En endring mot større vekt på bruk og levetid vil være i ullens favør. Det er dermed viktig å få frem kunnskap omkring miljøbelastning per natts søvn for ulike alternativer med ulik vaskehypphet. Det er en god ting at det som her er et gode for miljø, lavere vaskehypphet, også er et gode for forbrukere i form av rene senger med lavere arbeidsinnsats.

Norge og Sverige

Det er mange ulikheter i ull-bruk mellom Norge og Sverige. Noen av dem er knyttet til tradisjonelle plagg, slik som strikkegensere, håndstriking, bunader osv. I forhold til kroppsnær merino fremholder informantene at ulikhetene i interesse for utendørs vintersport er viktig. Vi tror normaliseringen av småbarns-påkledning i ull er mer avgjørende. For å forstå hvorfor denne endringen har skjedd i Norge og ikke andre land på samme vis burde vært undersøkt i flere

land med tanke på forholdet mellom klær og fysisk aktivitet både for spebarn, barnehagebarn og småskolebarn.

Når dette er sagt er det fortsatt mange muligheter for å øke, og forbedre ullbruken i Norge. Dette gjelder ikke minst praksisen med bomullstruser under ullundertøy. Markedet for gode alminnelige klær utover sport og utover tradisjonelle ullplagg som genser, jakke, votter og luer er fortsatt lite. Tynn daglig påkledning, undertøy for mer enn sport, innendørs trening osv. er lite og enda mindre kjent blant forbrukerne.

1 Introduction

The aim of the project is research and product development building on wool's inherent wellness credentials resulting in new consumer products through identifying the barriers for reintroducing wool as a textile for the bed. Our focus is the next-to-skin textiles in sleepwear and bedding.

Wool's property for regulating temperature and moisture is both well known and documented for apparel. Development and use of good wool clothing is moving forward for sports and leisurewear. Less attention has been paid to development in relation to sleep, in spite of knowledge that temperature and moisture-regulation is important for sleep quality. The closer to the skin the wool is, the more moisture-wicking and temperature-regulation qualities of wool will influence sleep-quality. However, product-development appears to have started in the 'other end' with wool-filled duvets, pillows, sleeping bags for babies and mattresses. Between the wool and the body there may be several layers of cotton, including nightwear, duvet-covers, pillow-cases, sheets along with the actual mattress and duvet-materials in different materials surrounding the filling. Wool next to skin would give more benefits for the user, but in addition meets more barriers as cotton for a long time has been the fibre of choice for bedding and nightwear – with little development except for some linen and silk alternatives in the high-end market. The use of cotton is closely linked to habits and routines that can be hard to change. This relates to both the perception of the bed itself and cleanliness/laundry. As there is no English word for all the many textiles in use in a bed, we have introduced 'wool-bed' which will cover sheets, duvet-covers, pillow-cases and night-wear such as pyjamas, night-dress etc. All wool textiles in the bed in contact with the skin can be understood as 'wool-bed'. We use this expression intermittently with differentiating bedding from nightwear.

The aim of the study *Wool-bed* is to gain an overview of barriers that need to be overcome and how wool's positive properties as a bed-textile can be communicated in order to move the market towards better sleep and up-take of the

wool-bed as a new norm. The research will concentrate on the two neighbouring countries, Norway and Sweden, with very similar climates and culture, but with very different use of wool and specifically very different up-take of next-to-skin wool underwear. These differences make a comparison ideal for transference to other markets and product-areas, with similar bed-habits, though unrelated to habits surrounding wool underwear. One would probably assume the barriers are lower in Norway, and much higher in Sweden for implementing a wool-bed,

This report is written in order to map the existing barriers towards a transition to a more extensive use of wool in the bed. We have written it on the premise that such a transition is positive. In other words, this is not a discussion of wool's characteristics as bed textile, but a discussion of how these properties could be optimized. Such a transition will be positive for consumers both because wool has some good qualities, and because this will have consequences beyond comfort and health, related to environmental issues (Laitala *et al.*, 2011).

The research is conducted in cooperation with two companies. One is Aclima, a specialized sports-wear manufacturer with solid experience in wool underwear and with a focus on health and functional aspects of textiles. The other is Lindholm Pure, a start-up developed by Kathrine Lindholm, who has experience from high-end interior products. Both companies work with product development and delivered woollen materials and products for testing in knit and woven qualities. The structure, colours, patterns and texture in relation to consumers' willingness to use textiles next to skin is already documented by pioneering research from SIFO. However, this needs to be further explored. The results will be used in the companies' on-going product development. Aclima will mainly focus on the outdoor sector, in addition to the health segment. Lindholm Pure will concentrate on the high end/luxury interior market for bedding.

The project has consisted of work-packages:

WP1 Wool-bed – Tradition and history

What do we know about habits and preferences when it comes to night-wear and bedding? When did cotton become the dominant textile for sleep and what barriers did cotton encounter historically? What remnants of use of wool can we find in beds today (blankets, etc.). Results of this WP will be presented in "Why cotton as linen? The use of wool in beds in Norway" (not yet published).

WP2 Wool-bed – Market

What products are available in/with wool that are on the market today? How are they marketed and for whom? (E.g. outdoor/expeditions, hospital/care/health/elderly, infants/children, alternative lifestyles, etc.). Results of this WP are presented in the SIFO report “Market for wool sleepwear and bedding”, http://www.sifo.no/files/file80169_project_report_no_4_-_2015.pdf.

This report answers the challenges presented in WP3-5:

WP3 Wool-bed – Barriers and possibilities

What types of barriers hinder the use of wool as a sleep-related textile (e.g. aesthetic, tactile, hygienic, cultural, practical, etc.)? Are barriers the same for bed-linen as for night-wear? Are the same barriers in play for adults, elderly and/or infants/children? Are the barriers related/unrelated to context (outdoor/in-house, private/institution, health-care/well-being). Are barriers related/unrelated to experiences with wool in other settings?

WP4 Wool-bed – Material choice

What materials (woven vs knitted/satin vs canvas) are best for bed-linen and night wear in wool? How do colours and patterns influence how the materials are perceived? Is the micron count of the products directly related to acceptability in a ‘wool-bed’? Or does spinning of the thread, looseness of the knit/weave, etc. play an equally important part of how the consumer feels about the end-product?

WP5 Wool-bed – Sleep quality

How is a switch from sleeping in cotton to sleeping in wool perceived?

These questions are answered through different methods presented in this report:

1. Web survey and qualitative interviews to explore barriers and experiences
2. A material sample-test to survey actual material choices and barriers.
3. User-tests to explore sleep quality and barriers to use.

133 respondents answered the web survey and we chose most of our 30 informants among them for interviews and material test. A selection of these informants were then chosen for user trials.

2 Method

In the qualitative study with 30 informants, half are Norwegian and half are Swedish. In selection of our informants, we did not strive for a statistically representative sample, but rather finding informants who mirror variations in barriers (purposeful sampling). We wanted to include informants from both countries, of both sexes and various age groups. An important parameter in the sample was informants' previous experience and attitudes to next-to-skin wool. We looked for informants who use wool daily in next-to-skin clothing and those who have little or no experience wearing merino. Further, we aimed to include some informants suffering from poor sleep-quality to see whether a wool bed could be beneficial to them. We did not aim to base the study on a large number of informants, but rather base the research on qualitative analysis of their experiences and opinions. There was also a request from one of the partners that the informants should be living in major cities and represent an affluent market. Therefore, we have selected a larger portion of such informants and all our informants live in Stockholm, Gothenburg, Oslo or districts close by.

2.1 Recruitment

Contact with our informants was established through various channels. In order to get a good diversity with different backgrounds in wool use and other background variables, we developed a survey that was available via internet (service provided by Lime survey, Appendix 1). A link to the web survey was sent to our private contacts and professional networks, and it was made available on SIFO's webpage and a selection of social media webpages. We encouraged the respondents to send the link to the survey to their contacts in order to achieve snowball effect.

The survey included mainly questions related to wool; use of the fibre, laundering frequency, various opinions and experiences, as well as sleep quality and use of nightwear.

Many of the questions had been used in earlier SIFO surveys. (a yearly web survey conducted on nationally representative sample in Norway). Based on these answers, it is possible to compare our sample against a nationally representative sample and thereby see any structural differences.

At the end of the web questionnaire, the respondents could choose if they allowed us to contact them for interviews, and they had the option of giving their contact information. We selected informants mainly among these respondents. 58% of the informants that answered the web survey said they were available for interviews.

In Sweden, we did not get enough respondents through the web survey in the urban areas we had decided on, so we recruited additional informants while visiting Gothenburg and Stockholm.

2.2 Informants

This section includes background data of our 30 informants that we interviewed. Unfortunately, five of the informants that we recruited through other means than the web survey did not fill out the questionnaire, despite an e-mail reminder. Therefore, we have information only on 25 of the 30 informants. For the remaining five we have filled in the data based on what they told us during the interview, to the degree information was available. Table 1 includes this background information.

Table 1: Pseudonyms and background information for all informants

Name	Country	Gender	Age	Household	Personal income in NOK/SEK	Household income in NOK/SEK	Livelihood	Education
Agnes	SE	F	38	Spouse and 3 children	Not answered	Not answered	Employed	Univ. up to 4 years
Astri	NO	F	55	Spouse	200 000 - 299 999	600 000 - 799 999	Unemployed	Univ. up to 4 years
Barbro	SE	F	49	Child	400 000 - 599 999	400 000 - 599 999	Employed	Univ. more than 4 years
Cecilia	NO	F	30	Spouse	400 000 - 599 999	1 000 000 - 1 199 000	Employed	Univ. up to 4 years
Charlotte	SE	F	57	Spouse and child (above 15)	300 000 - 399 999	800 000 - 999 999	Employed	Univ. up to 4 years
Cissi	SE	F	42	Two children	400 000 - 599 999	400 000 - 599 999	Employed	Secondary / vocational education
Elise	SE	F	56	Spouse and child	Below 200 000	400 000 - 599 999	Self-employed	Univ. more than 4 years
Emma	SE & NO	F	34	Single	400 000 - 599 999	400 000 - 599 999	Employed	Univ. more than 4 years
Eva	NO	F	33	Spouse and two children	400 000 - 599 999	600 000 - 799 999	Employed	Univ. more than 4 years
Irene	SE	F	40	Spouse and seven children	Below 200 000	400 000 - 599 999	Homemaker	Secondary / vocational education
Iris	SE	F	43	Child (above 15)	300 000 - 399 999	200 000 - 399 999	Employed	Univ. up to 4 years
Kari	NO	F	50	Spouse and two children (above 15)	Not answered	Not answered	Self-employed	Univ. more than 4 years
Laila	NO & SE	F	32	Spouse and child	300 000 - 399 999	600 000 - 799 999	Employed	Univ. more than 4 years
Lise	NO	F	41	Spouse and three children	400 000 - 599 999	1 200 000 - 1 399 000	Employed	Univ. more than 4 years
Mia	SE	F	25	Shared housing	Below 200 000	Below 200 000	Student	Univ. more than 4 years
Mikkel	NO	M	37	Spouse and two children	Not answered	Not answered	Employed	Univ. up to 4 years
Mille	SE	F	72	Single	Below 200 000	Below 200 000	Retired / Social Security	Univ. up to 4 years
Miranda	SE	F	60	Spouse and child (above 15)	400 000 - 599 999	1 400 000 or above	Employed	Univ. more than 4 years

Name	Country	Gender	Age	Household	Personal income in NOK/SEK	Household income in NOK/SEK	Livelihood	Education
Miriam	NO	F	31	Single	800 000 or above	1 000 000 - 1 199 000	Employed	Univ. more than 4 years
Mona	NO	F	30	Shared housing	400 000 - 599 999	1 200 000 - 1 399 000	Employed	Univ. up to 4 years
Ove	NO	M	32	Spouse and two children	600 000 - 799 999	1 000 000 - 1 199 000	Employed	Univ. more than 4 years
Per	NO	M	40	Single	400 000 - 599 999	400 000 - 599 999	Employed	Univ. more than 4 years
Rasha	NO	F	26	Shared housing	400 000 - 599 999	1 000 000 - 1 199 000	Employed	Univ. up to 4 years
Roy	SE	M	45	Spouse and two children	800 000 or above	1 200 000 - 1 399 000	Employed	Secondary / vocational education
Sandra	SE	F	49	Spouse and child (above 15)	Below 200 000	600 000 - 799 999	Student	Univ. more than 4 years
Sara	NO	F	33	Spouse and two children	400 000 - 599 999	1 400 000 or above	Employed	Univ. more than 4 years
Tina	NO	F	51	Single	400 000 - 599 999	400 000 - 599 999	Employed	Secondary / vocational education
Tony	NO	M	43	Single	400 000 - 599 999	400 000 - 599 999	Employed	Univ. up to 4 years
Vanja	SE	F	40	Spouse	200 000 - 299 999	600 000 - 799 999	Employed	Univ. more than 4 years
Vera	SE	F	54	Single	Not answered	Not answered	Employed	Univ. more than 4 years

Women were more eager to participate in the study. 89% of the respondents in in the web survey were women. Only 9 of the 14 men that answered the web survey responded that they could be contacted for an interview, which is another reason for recruiting additional informants through other channels.

Most of our informants have high education and are employed full time, with few exceptions. Table 2 gives an overview of age, gender, and country distribution of the informants.

Table 2: List of informants divided by country, age and gender

Country	Age	Female	Male	Total
Norway	25-34	7	1	8
	35-49	1	3	4
	50-72	3	0	3
Sweden	25-34	2	0	2
	35-49	7	1	7
	50-72	5	0	5
Total		25	5	30

In order to get comparable data of the wool use of informants, we asked them in the interviews how many of specific next-to-skin wool products they own. Products that were counted included:

- Short and long underpants
- Undershirts (singlets, t-shirts and long sleeved)
- Bras

We did not ask the informants to count stockings/tights or socks, as informants often did not have overview of the amount, and these products are more often made of mixed materials.

Table 3: Informants' use of wool. Socks, stockings and tights are excluded from the calculation of next-to-skin merino products

Code	Name	Number of next-to-skin merino products	How often did you use woollen clothes in February this year?
KS7	Agnes	0	(Missing)
IN3	Astri	9	Daily
IS2	Barbro	5	Often
KN1	Cecilia	18	Often
IS7	Charlotte	2	(Missing)
KS2	Cissi	0	Never
IS3	Elise	Missing	Daily
KS1	Emma	5	Often
KN7	Eva	9	Often
IS1	Irene	18	Daily
KS3	Iris	2	Daily
IN1	Kari	18	Daily
KN8	Laila	17	Daily
IN6	Lise	10	Often
IS6	Mia	2	Daily
IN2	Mikkel	7	(Missing)
IS4	Mille	4	Daily
KS4	Miranda	2	Often
IN4	Miriam	7	Often
KN5	Mona	14	Daily
IN7	Ove	5	Sometimes
KN2	Per	0	Never
IN5	Rasha	10	Sometimes
IS8	Roy	6	(Missing)
IS5	Sandra	Missing	Daily
KN6	Sara	9	Daily
KN4	Tina	5	Seldom
KN3	Tony	2	Seldom
KS5	Vanja	0	Daily
KS6	Vera	3	(Missing)

Despite that many of our Swedish informants were above average interested in textiles or wool, our Norwegian informants still had twice as many next-to-skin wool products (average 9.3 per person) compared to the Swedish informants who had 3.8 garments (table 3). Unfortunately, the amount is missing from two Swedish informants who had at least some wool products.

Table 4: When do you usually wear woollen clothing?

	Au- tumn /win- ter	Spring /sum- mer	Out- doors or ex- ercise	Sum- mer eve- nings	At the cabin	At din- ner par- ties and similar occa- sions	Celebra- tions such as national day and weddings	Don't use wool
Astri	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Barbro	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Cecilia	Yes	-	Yes	-	Yes	-	Yes	-
Cissi	Yes	-	-	Yes	Yes	-	-	-
Elise	Yes	-	Yes	Yes	Yes	-	-	-
Emma	Yes	-	Yes	Yes	Yes	-	-	-
Eva	Yes	-	Yes	-	-	-	-	-
Irene	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Iris	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Kari	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Laila	Yes	-	Yes	-	Yes	Yes	-	-
Lise	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Mia	Yes	-	Yes	Yes	Yes	Yes	-	-
Mille	Yes	-	Yes	Yes	-	-	-	-
Miranda	Yes	-	Yes	Yes	Yes	Yes	-	-
Miriam	Yes	-	Yes	Yes	Yes	-	-	-
Mona	Yes	-	Yes	-	Yes	-	Yes	-
Ove	Yes	-	Yes	Yes	Yes	-	-	-
Per	-	-	-	-	-	-	-	Yes
Rasha	Yes	-	Yes	-	Yes	-	Yes	-
Sandra	Yes	Yes	Yes	-	Yes	-	-	-
Sara	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
Tina	Yes	-	Yes	-	-	-	-	-
Tony	Yes	-	-	-	-	-	-	-
Vanja	Yes	Yes	Yes	Yes	-	-	-	-

Only one of our informants says that he did not use any wool at all, while all the others report to using wool mainly during autumn/winter, at the cabin, and outdoors/for exercise. It is less common to use wool in the summertime, apart from during evenings when it is cooler.

2.3 Web survey

The web survey was accessed in total 186 times and included 130 complete answers and 56 incomplete answers. Out of the incomplete answers, 49 were empty and therefore discarded. We deleted two additional answers because the respondents had answered twice. Five incomplete answers were kept. Out of these, two had answered the 2 first questions, two the first 4 questions and one to 7 first questions. This resulted in the total number of 133 responses.

The web survey was conducted in order to acquire suitable informants for the interviews. Therefore, the analysis of the survey results is limited to this purpose and gives just a general overview.

2.3.1 Use of woollen clothing

We wanted to recruit informants with different levels of experience in use of wool, and had two different questions related to this in the web questionnaire. The first one was “How often did you use woollen clothes in February this year?”. The answer distribution to this is given in Table 5.

Table 5: How often did you use woollen clothes in February this year? By country

Use frequency	Norway (N=90)	Sweden (N=41)
Never	4 %	5 %
Seldom	7 %	2 %
Sometimes	11 %	10 %
Often	16 %	20 %
Daily	61 %	59 %
Don't know	1 %	5 %

The results show that the respondents who have chosen to answer the survey use wool quite often in wintertime, as about 70% of them answered either *often* or *daily*. A comparison of the distribution of our informants' wool-use with the rest of the sample can be found in table 6. There was no significant difference between these groups.

Table 6: How often did you use woollen clothes in February this year? Our informants compared to rest of the sample

Use frequency	Our informants (N=25)	Other respondents (N=106)
Never	8 %	4 %
Seldom	8 %	5 %
Sometimes	8 %	11 %
Often	28 %	14 %
Daily	48 %	63 %
Don't know	0 %	3 %

The aim of the second question was to get more knowledge on when woollen clothing is used. Therefore, we listed some common use-settings and asked “When do you usually wear woollen clothes?”. The answers are given in Table 7.

Table 7: When do you usually wear woollen clothes? By country

Use occasion	Norway	Sweden
Autumn /winter	94 %	95 %
Spring /summer	53 %	59 %
Outdoors or for exercise	80 %	76 %
Summer evenings	67 %	71 %
At the cabin	67 %	56 %
At dinner parties and similar occasions	32 %	29 %
Celebrations such as national holiday, christenings and weddings	59 %	24 %
Don't use wool	4 %	5 %

As expected, it is most common to use wool during the cold seasons, winter and autumn, and less common during summer and spring. However, many respondents say they do use wool also in the summertime, for example when sitting outside during evenings. The only significant difference (95%) between the countries is use of wool in celebrations such as national holiday, weddings and christenings, which is much more common in Norway (where the national costume is more prevalent).

2.3.2 Laundering frequencies

We also wanted to get more information on the laundering frequencies of woollen products in comparison to similar products in cotton. Therefore, we asked “How many times do you usually use the following products before they are laundered?”. The answer distribution is given in Table 8. One answering option was “I don’t use such products”, and these answers are given in Table 9.

Table 8: How many times do you usually use the following products before they are laundered? By country

Country		Cotton t-shirt	Woollen underwear	Cotton sweater	Woollen sweater
Norway	Mean	1,7	7,9	3,4	31,3
	Median	1,0	4,0	2,0	10,0
	Minimum	1	1	1	1
	Maximum	6	200	30	500
	N	85	82	86	85
	Std. Deviation	1,0	22,6	4,7	76,7
Sweden	Mean	2,1	9,5	4,2	32,9
	Median	2,0	7,0	3,0	15,0
	Minimum	1	1	1	1
	Maximum	5	30	20	200
	N	34	29	36	37
	Std. Deviation	1,1	7,5	3,3	40,0

The results show that respondents laundered woollen products considerably less frequently than similar products in cotton. Next-to-skin shirts are laundered more often than sweaters.

Table 9: Don't use such products

	Norway	Sweden
Cotton t-shirt	4 %	15 %
Woollen underwear	8 %	28 %
Cotton sweater	3 %	10 %
Woollen sweater	4 %	8 %

We asked the same question in the SIFO survey 2011 (N=1094). The distribution of this representative sample is given in table 10. The comparison show that our respondents use woollen products a lot longer between washes than the average Norwegians. This may be because they are more knowledgeable of the properties of wool, but also that there has been a change in the general knowledge from 2011.

Table 10: SIFO survey 2011 (N=1094)

SIFO survey 2011	Cotton t-shirt	Woollen undershirt	Cotton sweater	Woollen sweater
Mean (below 99)	2,8	3,9	4,7	8,9
Median	2	3	3	5
Mode	1	1	2	10

2.3.3 Opinions on wool

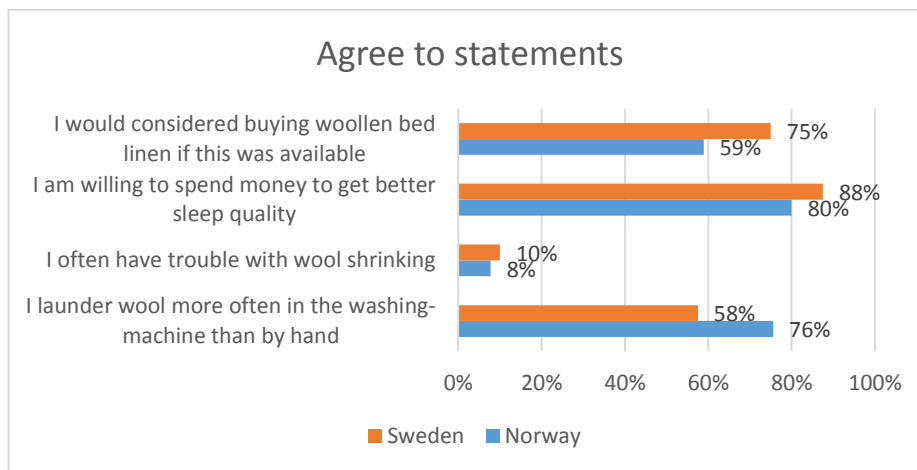
We gave four statements that the respondents could agree or disagree with. Do you agree with the following statements?

- I launder wool more often in the washing-machine than by hand
- I often have trouble with wool shrinking
- I am willing to spend money to get better sleep quality
- I would consider buying woollen bed linen if this was available

The answer distribution is given in Table 11 and percentage of positive answers in Figure 1.

Table 11: Opinions on statements of wool

Statement	Norway [%]			Sweden [%]		
	Yes	No	Don't know	Yes	No	Don't know
I launder wool more often in the washing-machine than by hand	76 %	21 %	3 %	58 %	38 %	5 %
I often have trouble with wool shrinking	8 %	87 %	6 %	10 %	85 %	5 %
I am willing to spend money to get better sleep quality	80 %	6 %	14 %	88 %	5 %	8 %
I would considered buying woollen bed linen if this was available	59 %	16 %	26 %	75 %	0 %	25 %

**Figure 1: Agreement with statements of wool. By country.**

The results show that Norwegians launder wool more often in the washing-machine than Swedes, and that Swedish respondents were more positive to the idea of woollen bedlinen and to spending money for improved sleep quality. Many respondents were uncertain about whether they would consider buying woollen bedlinen.

2.3.4 Use of nightwear

We asked the respondents about their use of sleepwear, and gave four alternatives for various clothing and asked how often they used each of the four alternatives. The results are given in Figure 2, where highest results indicate more frequent use of the specific sleepwear. The results show that men do not usually use specific nightwear but rather sleep in underwear or naked. For women, it is equally common to use nightwear, underwear or sleep naked. It is least common to sleep in long-johns and/or long-sleeved underwear.

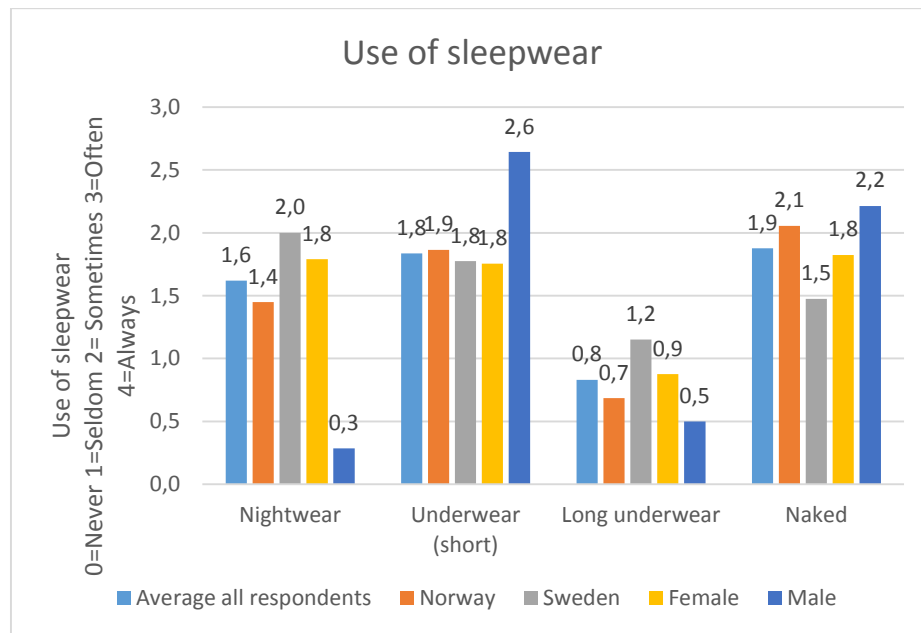


Figure 2: Use of sleepwear. By country and gender.

We were also interested in their previous experiences of using wool in the bed, and asked the question “Have you slept in woollen bedlinen/nightwear during the past year?”. The answer distribution is given in Figure 3 divided by the two countries.

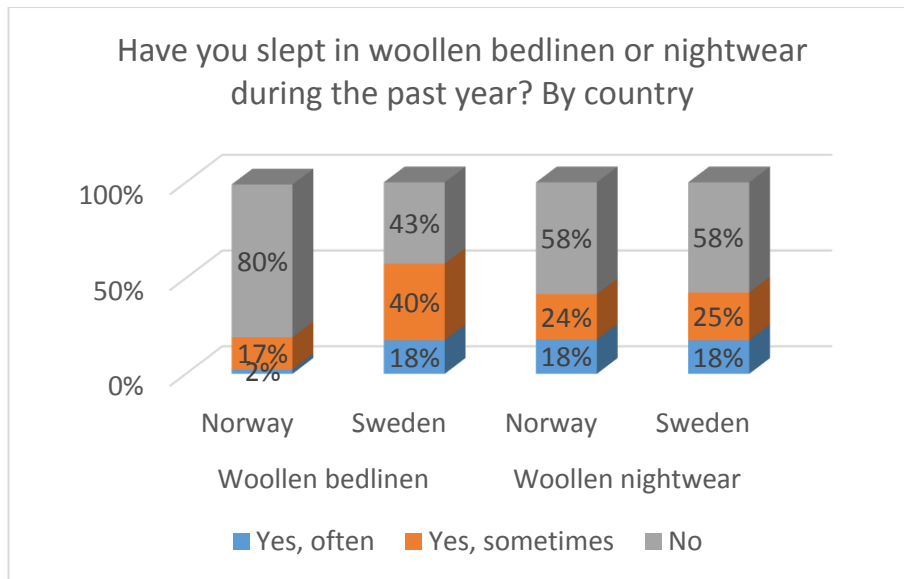


Figure 3: Experiences of wool in the bed

There is significant difference between Norwegian and Swedish respondents in how many had slept in woollen bedlinen or with woollen blankets the past year, as this was much more common among the Swedes. There was no significant difference in use of woollen nightwear. However, one must remember that these results are not representative for the countries, as we have many respondents who are more interested in wool and/or textiles than average consumers are.

2.3.5 Sleep problems

We asked whether the informants had problems either in falling asleep at night or whether they wake up during the night (Table 12). About a third had no problems, a bit more than a third had problems sometimes, and the remaining had frequent problems. There was no significant difference between our Norwegian and Swedish respondents. As this is health-related information, we did not ask for more sensitive details in the web survey, but tried to recruit informants from all three categories to the interviews. About half of our informants had problems sometimes (52%), a fifth often, and the remaining 28% did not report any problems.

Table 12: Level of sleep problems

Sleep problems	Norway	Sweden
No problem	36 %	35 %
Yes, sometimes	38 %	35 %
Yes, often	26 %	30 %

3 Interviews

This section gives the interview results divided into the different topics that either were decided beforehand or emerged during the interviews. The interview guide can be found in Appendix 2.

3.1 How wool is understood

How wool is understood in the interviews and in general marketing varies from often repeated statements that have become generally accepted among consumers, to rarer and more original ideas that are not often voiced. The purpose of this chapter is to show the diversity of emotions, aesthetics and ideology relating to wool. We will then discuss the understanding of wool more in detail and how this relates to the knowledge of wool's properties. This is important to understand in relation to why informants choose to use wool, and how wool is used.

The following statements are mainly from the beginning of the interviews. We opened by asking informants to describe their relationship with wool and the way in which they use wool. In line with the questions, the answers are open-ended and cover a wide spectre, but at the same time they also capture the essence in the informants' associations, because this is the first thing that strikes them. Some of the statements have surfaced later in the interviews, and have been selected to widen the picture of what wool can be.

3.1.1 As love

Lise talks with warmth in her voice about wool. "I am fond of knitting so I have a love for wool yarn." She has children and "wraps them in wool when it gets cold," and uses it even in summer. "I often use a wool cardigan and I love any kind of wool shawl." Wool socks are used year round, and during winter wool

is worn next to skin and layered, with long-johns and a woollen top. She is not alone when it comes to the cold or winter season seen as a "pretext" to use wool, and as something she is looking forward to.

Something similar is voiced by Racha, who is young, active and much 'warmer' than Lise. "Mom has knitted sweaters for me my whole life, so actually yesterday I said I could not wait until I can start wearing sweaters again, when it gets cold enough for that. Mom's sweaters warm me both because they are made with love and because they are warm and beautiful." Many informants have a similar relationship with wool, especially the thicker, hand-knitted garments. So although hand-knitted socks have been replaced with thin store-bought socks "which were not common to buy in a shop when I was little" something is unchanged. "Because mother's hand-knitted sweaters I've had all along." (Tony)

3.1.2 As a cave or second skin

Astrid talks about her son when he was little: He "lived" in natural coloured wool underwear day and night throughout the winter. When spring came "I said that now you need to take it off because it's so hot. And then he mourned; he was so extremely attached to the woollen underwear and it had to be white, natural coloured wool. He had a very close relationship with the underwear; when he was like 4 years old, and it was not laundered so often, it was not something that came and went but was just there". (Astrid).

That the wool was not washed frequently, and wasn't changed between different activities, or between night and day, made the little boy feel safe in it. While other clothes came and went, he experienced wool underwear as something that was a part of himself, like a second skin or a cave.

3.1.3 As security

Mikkel talks about their kids who are 3 and 5. They have their own wool pyjamas that they use and like very much to sleep in. And they do not seem hotter in these than in cotton pyjamas. "They kick off the covers, and it feels better somehow. If they sleep in wool. We are after all concerned whether they are cold at night." Mikkel and his wife sleep better because they feel confident that your children are not cold. The natural instinct to warm and protect one's children is possible, even when they sleep alone through the wool's ability to regulate temperature. This sense of security is probably also at the core of dressing children in kindergarten and other places where the need to feel confident as parents, that your children are doing well in your absence, is central.

3.1.4 As children's clothes

"All babies in Norway have wool," says Ove, father of two toddlers. And although babies have more than toddlers, the wool wardrobe continues in winter for "all Norwegian children. They have that wool underwear. And then they put on a down suit over when they are out and about." Sara also talks about this: "They use lots of wool. Now we are at that stage (autumn) that we begin to only wear wool". So during the winter they only wear wool long-johns and woollen tops in the kindergarten and at home. Also, a wool sweater and on top of this they can either have a "pair of pants that is not wool", but also "outside pants in wool" (Sara). Several of our Swedish interviewees believe wool has particularly good properties for toddlers. E.g. Barbro. "The more one discovers wool the more you have to have it, I feel. At least for my child, he has had wool diapers that I have knitted as well. And he has always been warm even though he has wet himself. As children do, they get soaked. It has always felt very safe in a way." However, those who have dressed their babies in wool have not done so because it was the norm. Wool as standard attire for babies and kindergarten children is referred to as norm in Norway, and somewhat unusual in Sweden. Therefore, we will come back to this in the discussion of the differences between the two countries. There we will obviously also discuss the next understanding of wool, as something 'national'.

3.1.5 As Norwegian

"I am quite Norwegian. I should add that my mom always dressed us children in wool. That I've always worn wool. With minus degrees you should wear long-johns and they should always be wool. And you should also wear wool socks, I'm used to that. At least if you're going out and doing winter activities, on with the full set of wool underwear before going out and before getting cold." (Mona)

3.1.6 As flexibility

"Wool comes in so many qualities and the material result has very different surface expressions depending on the wool you use and how you manufacture the textile. So I think that it is very nice. The aesthetic. I think it is rather nice with the coarser wool clothes like with these trousers. But I also think it's very nice with this thin wool being both very matte and fine. And it stays nice, it does not wrinkle. I can sit for a long time in my chair and work in front of the computer and it does not crease." (Laila) Because wool can be so different, and because it "remains clean for a long time" and is "always comfy, just warm enough, I think yes, because I use both thin wool and thick wool" she is "never

sweaty or clammy" and "cool at the same time". So, I think that in fact this is a big advantage" (Laila). The flexibility which Laila describes concerns both different qualities of wool products and the flexibility of the characteristics of wool in itself. In this report, we focus on merino specifically and thus the thin, soft qualities. This means that the flexibility that the different types represent will not be so much discussed beyond where these are important for the understanding and use of the soft/thin wools.

Flexibility is a key word in the informants' way of talking about wool, and it appears that wool is used more flexibly than clothing made of other materials. Irene sleeps in wool underwear, and also uses this at home as indoor clothing. "So it's not locked," she says "The older children dress themselves in longjohns/undergarments and go off to school more or less in just that. If they have trousers over, they become too hot." A boundary goes at boy's long-johns with a visible fly. "And girls are either wearing more or less the same, or wearing a dress over," This also means that there is less difference between everyday and social situations, an upgrade can be carried out by using the same garment but adding something. The flexibility in the use of clothes may have to do with that woollen clothes are expensive and thus children have fewer garments overall and therefore are forced to use them for more occasions than if they had a bigger wardrobe. However, it may also be that the products are perceived as less locked into a specific use. As this theme is less about bed linens than boundaries for clothing and underwear, we will not pursue this here. However, children in the kindergarten and Norwegians at their cabins "waltz around" in underwear all day - and thus the border between sleepwear/underwear and use of wool underwear during the day can dissolve in some contexts.

3.1.7 As a natural fibre

"I am very fond of wool, it is the best natural fibre," says Sara, while Mille presents herself as a "wool-lover". She "does not like synthetic materials. So I use only natural ones". In the presentation of wool's many virtues, wool as natural versus synthetic is spontaneously cited: "I like natural products and the lack of uncomfortable sweating and it stays fresh longer. It never smells bad. Synthetics get dirty right away. There is a big difference. It is noticeable if one washes a synthetic garment if you have used it a day, the water is completely filthy, while a woollen top you wore a year; when you wash it there is almost no dirt." (Mille) In telling the story, her own experiences are mixed into a more ideological rooted understanding of nature as something better. Another person concerned with wool as a natural material, is Roy. He is craftsman and works with wood. "Wool for me it is something positive as a material. In contrast to a synthetic fibre. This is something I just believe and it makes me choose wool

underwear rather than anything in polyester. Another advantage of wool is that if it gets wet it does not get cold. Gloves and stuff. And since I work outside a lot, I need to have a lot of clothes on me but I'm often wet and cold, so I choose wool." (Roy)

Barbro is also concerned with the natural way wool is "a material that somehow grows by itself, new from the sheep, and it feels like a fairly simple process. A natural process somehow." (Barbara) She wants "organic wool – but unfortunately that means pests. Small holes appear in the expensive, fine garments. So it's an uncomfortable feeling in a way". Nature is not always cooperative. However, wool as nature is interpreted in many ways:

3.1.8 As authentic

"Everything must be wool and not an imitation." (Miriam). This can also be perceived in the opposite way, i.e. that many synthetic materials are imitations of wool. This relates in particular to acrylic knitwear and polyester fleece. Wool as genuine or 'true nature' puts some limitations on the processing of wool (for some). We will return to this in the chapter on 'super-wash'.

3.1.9 As ideology

We ask Irene what must be wool: "Whatever is closest to the body, absolutely. But preferably all the way through," she replies and has many good reasons for this. However, the relationship between the desire to have mostly wool, i.e. wool in all layers, and the properties, are not entirely obvious. The properties can be understood as the reason for the selection, but also as a justification for it. Because it is more common to talk about practical matters than aesthetic, ideological and religious, this is an aspect of the options that is less evident in the interviews. It does not necessarily mean that it's not important. We therefore hope that the reader can have this as a backdrop in the further reading and we will return to this theme later.

3.1.10 As comfort and wellbeing

Irene has, as we just discuss an ideological relationship with wool, and is generally a person who wants to live in alignment with good principles. There are many good reasons for her and her seven children to dress in wool from the inside out, if she gets her will. However, the biggest advantage is still neither practical nor ideological. It is that "I find it lovely!" Again this idea of inherent wellbeing along with technical features such as; "One does not become sweaty in the same manner as in cotton and synthetics. And it's lovely to not have to

dress the kids in a whole lot. Children should be able to move in order to evolve and learn things." (Irene) It is clear that the experience of wellbeing, is also providing added value, such as learning, fun and an easier everyday life. However, the sensual and beauty is still there and are highlighted when communicating what is most important about wool.

Irene uses the phrase 'lovely'. While Kari uses 'comfort' and 'comfortable'. She says: "The comfort, the feeling of being comfortable and the softness and yes the environment you're in, it works when it's hot and it's good when it's cold. It is all-round pleasantness I become more and more, yes we could call it, in love with. Outdoors and indoors." (Kari) A third adjective with much of the same content is 'wonderful'. Advantages of wool? Cecilie answers: "It is wonderful! The uniform in the winter it's underwear, and a sweater. Kari Traa (Norwegian sportswear brand for women). So then my sweatpants are replaced with super-undies (denotes long wool-underwear)." She uses it partly as lounge garments indoors - and therefore not as something really defined as underwear. Home clothing is little explored (Borregaard, 2007) but we see that being relaxed and physical comfort are essential aspects of this attire. There are special clothes for this, also in wool, but in our material it is mostly underwear and nightwear used in this way. And in this use of woollen underwear (as leisurewear), dressing at the cabins holds a special position, which we will now look into.

3.1.11 Outdoor activities and cabins

At the cabins "one wallows around in wool all day. One gets up in the morning and puts on long-johns. And then you wear them until you go out and then you put on something over which is water/windproof and then you peel that off when you come back and then you lounge around in wool all evening. It is the Norwegian DNA out and about, in a nutshell." (Ove) Even those who do not use wool can talk about this: "The only time I can remember that I voluntarily used wool clothes growing up was when I was skiing up in mountains." (Per) Cabins and skiing are synonymous in Norway and in parts of Sweden. When skiing "it has to be in wool" (Astrid). However, this can also be wool blended with more technical fibres. Miriam explains: "And then of course you have cabin-wool, wool underwear, sportswear and socks, to ski in and for exercise use and a technical form of wool underwear, which is a mix with other materials as well." (Miriam). We return to cabin-use of wool in the discussion about the relationship between Norwegian and Swedish wool-use, as when it comes to Norwegians' relationship with skiing and cabin life, Swedish and Norwegian informants agree: This is typically Norwegian.

3.1.12 As an environmental choice

"It is more and more tempting to choose wool rather than cotton because it is more environmentally friendly," says Lise. And Irene did not believe less laundering for the 7 children was the main motivation for using more wool, but rather not adding to cotton's impact on nature. With the exception of one person who works with wool and environmental issues, the fact that wool scores badly in international comparison of fibres, this is not an issue. Rather the informants take it for granted that wool is a good environmental choice. In their discussions on the environmental properties of wool, it is cotton that they compare with, and not the synthetic fibres. The international ranking of wool as an environmental offender is not brought up by the informants, instead, they are more aware of animal welfare issues. They associated it with mulesing and with Australia.

3.1.13 As animal mistreatment

Most of the informants are somewhat vague in relation to mulesing. "One has heard of the sheep and how they are mistreated - what do you call it... mmmm... I forgot what it's called." (Vera). But this has little to no consequences for their own wool-use. However, for those who do not use wool they argue that: "I cannot even remember if I have anything in wool (...) some knitted woollen pullover I must have had. I lived out in the country before and we had woollen blankets and I used to have merino underwear and then there was the debate and so I thought it was terrible". Why she chose not to use wool for their children: "it was because of the debate, I did not buy wool underwear for the kids because I was sceptical". (Cicci).

3.1.14 As longevity

For us longevity is what offers the most important environmental advantage for wool (Laitala, 2014), but although the informants do not discuss this directly, they are concerned about the durability of the clothes. One of them is Roy. "When it comes to clothing, or really in general, I want things of quality. Long lasting instead of low quality that only lasts for a short time, so I have to buy new. This is a smarter way to shop. Also the clothes age in a positive way. For example, these pants, they are just more and more beautiful the more you wear them." Here Roy uses a pair of trousers in cotton and linen as an example, but the reasoning is related to the future of wool. He believes more people will become like him and emphasize longevity and beautiful aging.

Agnes is also concerned with durability. "Other fabrics, especially the new ones that are made of a plastic polymer and mixed with cotton and all sorts of stuff, they become so worn through laundering. I buy them generally a little cheaper and then I wash them in quite warm water as they smell more, they smell more when made from plastic. And then I throw them away sooner. But wool keeps through many, many washes and looks really not the least worn out, it takes a long time before wool looks worn out. And (wool) very rarely smells bad." (Agnes). Here we see that lifespan and laundering are linked together and also to the ability to stay clean. However, even the absence of foul smells is also a feature in itself.

3.1.15 As absence of foul smells

"Often when you buy a sweater in synthetic acrylic, one notices that it is uncomfortable and hot in a bad way and then you start to smell and woollens do not smell." (Emma) Astrid experiences that she can "go much longer with woollen clothes than in other textiles". The ability to stay clean is something we will discuss more in detail and we will compare this to the understanding of hygiene and the desire to launder bedding and clothing at higher temperatures and with more agitation than wool is normally treated during laundering.

3.1.16 As health

"One of the older children (9 years old) has atopic skin and asthma and I have experienced that he has been much better after he has used wool." He uses wool "next to skin" explains mom Irene. "He wants wool and he asks for wool, for he has experienced that it helps." This experience stands in contrast to others who say they (or their children) cannot have wool because of eczema or sensitive skin.

3.1.17 As warm

"Wool is warm." (Tina) "So yes, if I need a warm sweater, it must be in wool and if I need a warm top, then it also has to be wool. I cannot imagine anything else. Yes, fleece, but it does not have the same quality as wool." (Sara). "I never use wool, and I am very sensitive to temperature and prefer it to be relatively cool really." (Per) Heat is, as we see here something that is perceived both negatively and positively. Heat is important in relation to a possible use of wool in bedding, and we shall therefore discuss this in more detail later.

3.1.18 As itchy

"My youngest daughter, she refuses to use wool at all. She thinks that everything itches. And ... yes I have tried to fool her and have said that it is cotton (laughter). That did not work. She is like the Princess and the pea." (Agnes). Eva still thinks that wool can be itchy "so I only use merino or blends of wool and silk." We will return to wool and itching in relation to knowledge and in discussions about how bedlinen in wool could work or not.

3.1.19 As an undesirable style

When we asked Tina if there is anything that could *not* be in wool, she replied, "not that it cannot but I do not like wool clothes beyond long-johns and socks and sweaters. I would never wear a dress or stuff like that in wool. It's just that I do not like the style somehow." We tried to understand this statement better and asked if this applies to both knitted and woven wool? "Yes, but when I think ... yes that would obviously work. I thought more of some kind of knit-wear. So it's the style then, but woven wool, that would be fine. Except that it probably is too hot for me." (Tina) So we see that her associations with wool limits itself to knitted garments, and maybe even to hand-knitted clothing in thicker wool. The fact that wool is associated so strongly with knits (and hand knitting) contributes to wool not being thought of in relation to other types of fabric structures or techniques, or even specific clothing (Hebrok, Klepp & Turney, 2016). The strong association between wool and particular use/clothing, is something that both makes it easier to sell something in wool, while hard to get new products on the market. We shall discuss this in relation to how a change can take place.

As we have seen there are many ways to understand wool and obviously many more that we have not touched on. In the next chapter, the ways of understanding wool's greatest impact in relation to the potential for wool bed textiles, will be discussed. The first thing we discuss is the relationship between knowledge about, experiences with and prejudices against textiles and specifically wool.

3.2 Woolly textile knowledge

The level of knowledge among the interviewees is quite varied. This is not surprising given that we have a number of informants who work with textiles professionally or as a hobby, and that we deliberately sought variation in the informants' relationship with wool. In this section on knowledge, we aim to understand more about what the informants know about textiles and wool, as well

as the relationship between knowledge as something learned and their own experiences. In the discussion about wool bedlinen, it is essential that the potential buyer sees the benefit of the wool bedding, because it may be significantly more expensive than other bedding. Thus knowledge about textiles is essential for the discussion throughout the report.

3.2.1 Mixing wool type with material production

Asked about he knows of different types of wool, Per responds: "the only thing I know is the name of merino wool, but I do not know what kind it is. The only other thing is 'vadmél' (coarse loden-type woven material), it is a type of wool that is very rough. I have no idea how they make 'vadmél' compared to other woollen textiles. I only know the name, not much more." (Per) As we see, he remembers two names, 'vadmél' and merino and associates 'vadmél' with something rougher, but only has a vague idea about what this is and how it is made. That only 'merino' actually answers our questions about wool types. and not fabrics of wool, shows that he does not clearly distinguish between the two. The same mix-up surfaces when he talks about cotton. "My duvet-cover is relatively thick for being cotton, so I wonder if it might be a different fabric than cotton, but I'm pretty sure it's not wool." (Per)

Per is not alone. There is considerable confusion about the relationship between textile raw materials and production forms such as weave or surface treatments. When Mona here talks about the kind of bedlinen she uses, she says that she is "not happy in satin. That I avoid. I have one set of bedding in flannel, the rest in cotton." (Mona) Like several others, she speaks about cotton and satin as two different things, and also of flannel as something other than cotton. One interpretation of her statement is that 'cotton' here signifies a plain weave and not bedding in a particular raw material.

In addition to confusion about words, many do not appear to know what kind of materials their clothes are made of. They have not checked or they do not remember. Charlotte is unsure what she has made of wool. "There is underwear. I think that I have that. I'm not quite sure because there's so much synthetic. So I wonder if - maybe the children have some. I'm a little uncertain actually." (Charlotte).

3.2.2 Transfer of terms from one material to similar products

Many of the informants call underwear "super (thermal) underwear in wool". The term 'super' is taken from marketing of synthetic underwear for sports. We were somewhat surprised with the terminology, because super is precisely used

to distinguish the synthetic from underwear in wool, such as in discussions "what is best, wool or super underwear?" (G-sport 2015). However, we see that some companies use the term in the same way as the informants in a type of clothing which can then be made of either wool or synthetics or a mixture¹.

3.2.3 Sheep and other wool-producing animals

This report is mainly about merino, which is a widely used breed for production of softer wool qualities. However, it is not evident that the informants know this, or that they distinguish wool from sheep compared to other wool-producing animals. We asked about this, but it's difficult to ask about things people do not know - or have little reflection about.

That wool may come from different animals and different sheep breeds is not at all clear. "Different types? I must admit that I never look for this type of information when I buy. You mean type of sheep? Or? Yes, no, I don't know. I have not checked what's on the tag. The only thing is the lining in gloves which is almost always lamb's wool." Tina here talks about information she was not looking for, but at the same time she says at least indirectly that she reckons that this information exists. And that is not always the case. Fibre labelling indicates only the percentage of wool, not what kind (though sometimes lamb's wool is specified), and it is up to the manufacturers to provide more information if they wish. Thinner wool is often marketed as merino to distinguish it from other coarser wool. This distinction we see that the informants also use.

"In my head there is the kind of wool used in woollen socks. (Laughter.) Then you have the kind I have in a wool undershirt and I think it's merino wool. Through advertising, I've heard about merino wool. And that's as far as I know a wool type that is from a sheep breed in Australia. There has also been some news about the sheep not being treated well. That's negative." (Mona) We see the way Mona here talks both about wool types and mulesing, that this is not something she is absolutely certain about or something that is particularly high on her agenda. This is typical of the way informants answer about wool types.

Some of the most active knitters and hobby spinners of course know about the different sheep breeds and other animals with hair or fur that can become yarns, but generally the distinction is between merino and 'coarser wool' when we ask about types of wool. This distinction is not only a question about breed and

¹ See http://shop.hellyhansen.com/gb/item/w-hhwarm-freeze-1-2-zip-48543/?t_type=rvp as an example.

country of origin, but also the different traditions in the use of wool. In the following chapters, we will operate with a distinction where on the one hand traditional use of coarser wool in knits is one thing, while merino designates all finer wool that in our context first and foremost is discussed in connection with underwear and sleepwear. It is quite possible to be dedicated to one of these two wool types without having any active relationship with the other. The association between the use of the two different wool types will be important in the chapter about a change towards more use of wool.

3.2.4 Wool breathes

That wool ‘breathes’ is something several informants argue. One of them is Tine. We ask if wool has other advantages than being warm? "It's airy, it breathes better. It feels less dense, airy." (Tine) Tine uses little wool, but still has knowledge about wool's user qualities. This phrase ‘breathes’ recurs when describing wool's properties. It is probably an expression that has come via sports, describing synthetic materials that let the moisture pass through, f. ex Goretex. However, the informants generally say that natural materials breathe. This is likely to be a reference to that they absorb moisture and let the air go through and that they thus feel more comfortable in use. The ability to ‘breathe’, in the understanding of absorbing moisture, is one of the important positive aspects as the informants see it.

Closely associated with the ability to breathe is the absence of static. This is important to Ove. "The alternative to wool is often, not next-to-skin, but the next layer and is fleece and I can't deal with the static electricity, the feeling you get from these plastic substances, I go completely crazy. So it is very pleasant with wool not being static. You can take it off without crackling and you can put on something later without it exploding. It's maybe the best thing." (Ove).

Wool's ability to absorb moisture contributes both to wicking moisture away and that it does not feel so dry and thus electric.

3.2.5 Super-wash

None of our questions are on ‘super-wash’ directly. Three of our Swedish informants (Iris, Agnes and Mille) are all very sceptical to this treatment. "I cannot imagine knitting in something other than wool," explains Iris. She both knits and spins "It's incomparable. When one knows about wool's properties and then read what they do with e.g. super-wash then you have sabotaged wool entirely."

She says she feels more 'trapped' in processed wool and then explains the durability of a sweater she knitted for her husband and how her son's mittens were: "He never froze and he could make no matter how many snowballs. They are just as nice today. So they are really wonderful." Both of these properties (durability and warmth) is something she believes would be destroyed through a 'super-wash' treatment. "Yes, I avoid it even though they very often try to sell it to you in the yarn shop; many people find it so difficult to wash wool, it shrinks and stuff. But there is not much you need to do with the wool really, it cleans itself." (Iris) She believes therefore that the treatment both destroys the wool and is unnecessary.

Agnes could not agree more: She has an active relationship with wool and all processes from wool to fabric, via carding, spinning, etc. "For my part I very much differentiate super-wash treated wool from other wool, as that plastic processing of the wool takes away wool's amazing properties and as they cover the shells that surround the wool fibre. If you super-wash treat it, I think a lot of the wool properties are lost in favour of making the wool easy-care for modern people who do not have as good wool knowledge as perhaps wool nerds have." Agnes uses clothing and interior fabrics in wool "and then preferably as pure as possible." (Agnes) Although she does not have underwear for herself, she happily buys "wool underwear for my children, but it is difficult to find underwear that are not super-wash treated". (Agnes).

"Once I made a mistake and bought super-wash treated wool and that was absolutely worthless as it lost its shape. (...) So I think there is a need for information on laundering so you do not need super-wash." (Mille).

Perhaps they have been influenced by a Norwegian website for the firm *Nøstebarn*². They say that their wool is 'untreated' and emphasize the difference between 'treated' and 'untreated wool'. In the quote above Iris says that she 'reads' what the treatment does and it may be this website she refers to. Both also say that they experience a big difference. The relationship between knowledge as something acquired, and experience, is interesting. Certainly as is generally the case, focus on the difference will be spurred by reading about it. None of the other informants were concerned about this distinction, even though many of them have experience from garments both with and without 'super-wash' treatment. It is also interesting that the different characteristics of the wool that are high-lighted, are claimed to be destroyed by the treatment: the feeling of the garment, dimensional stability, warmth and durability - but there is also another possible interpretation and that is that wool's 'naturalness' is

² <http://nostebarn.no/>

primarily lost through the process. With this we return to one of the qualities we mentioned in the introduction. Probably the ‘naturalness’ of wool is more or less relevant in different contexts. Again a topic we cannot explore more in-depth here.

3.2.6 Felting

The ability to felt is not something we have asked about, and not something they are particularly concerned about. As Agnes says this property can be both negative and positive. "If it's a good, long-fibred wool then it's a wonderful material to wear and be warm in, and even the property that one can felt the wool is good. So it becomes windproof." (Agnes) Is there any problem with wool we ask. "Hmmmmmmm ...it could certainly be just that, the felting ability, it may become impossible to use if you end up felting a garment. But that is again about knowledge on how to take care of wool." (Agnes) Therefore, the conclusion is that felting is a fantastic feature because it provides opportunities, but that it also requires something of the user: Knowledge. We will return to this in connection with laundering and then in relation to counteracting that woollens felt, thereby shrink during laundering.

Knowledge about this property of wool is not especially good. On the one hand the informants know that wool must be washed properly (Hebrok *et al* 2012). However, it is the heat that is given the blame when something goes wrong. Not mechanical treatment or the wrong detergents. Many also believe (wrongly) that the spin cycle shrinks wool, which then contributes to more inconvenience.

3.2.7 Itch

In international studies itching is one of the things that comes up as an important obstacle in the use of wool (Laing *et al.*, 2014), but the fact that wool itches is not something that the informants are very concerned about. Per, who does not use wool, does not perceive that this is a problem. Itch? "No, that is not something I care about anymore, I reacted to it when I was little, but not now really. But it can be annoying. The main reason I don't choose wool is that it can be an annoyance. The uncomfortable temperature." (Per). The fact that wool does not itch does not necessarily say whether it is suitable for next-to-skin garments. Per is shown a boxer-shorts from Aclima and responds to it, "this is very thin... but anyway ... somehow the texture is not, you mentioned earlier if I react to itching. That is not so important. But when I touch this it does not feel like a type of fabric that I would like to have next to skin. Because of the texture of the fabric. But it is very thin, so it might be comfortable temperature-wise." Although he does not believe the boxer will be too hot or itch, he does not like

the feeling the wool provides. On the other side are the informants who like wool, and are not bothered by the itching. Mia is not "so taken with mixed fibres. Not polyester and wool and stuff, but pure wool"; on the other hand, she is "not so sensitive either, I can wear prickly wool without any problem." (Mia).

For most of the informants, wool does not and should not itch. "But it rarely does that nowadays," says Tina. And with this she stresses how wool used to be something associated with prickliness, but no longer. Wool is warm and no longer itchy for Tina. However, if this change is due to themselves or changes in the clothes, they are more uncertain about. "When I was a child, it might just have something to do with that, I think the wool was much poorer and pricklier then now. But it could be that it felt more prickly, but I think I've read that they have become better at making wool that does not itch." (Tina) She is, in other words, not quite sure if it's herself or the wool products, or both, that have changed. For Mia this change in production is not something important. She likes and uses virtually only vintage clothing and thus mostly wool from the 1930s to the 1960s, they "keep and are still really warm and beautiful." (Mia).

Everyone is not like Mia and a possible solution for them is to have something else underneath. Mona talks about this "if you have wool socks it doesn't matter, because you have cotton socks inside. That's why you use more super underwear. I remember when we were young and I did not want wool because it itched. Now as grown up and with your own money to spend on clothes, people are more aware that it should not irritate in any way." (Mona). That cotton socks under woollen socks is no optimal solution in relation to the warmth, is something she does not consider. Mia also mentions this solution which her customers described when she worked in the clothing store for children. "They came in and said that the woollen stockings were not warm, but that was because they used cotton stockings inside and then they were not warm at all. They had no idea!" (Mia).

Another solution is to have finer wool underneath the wool that itches. "Yes, I have no problem with this because the wool clothes that I have that itch a little they are always over something else, underwear or other clothing. So I've got some big knitted sweaters. Yes, they itch a little. But those I don't have next to skin, so it doesn't matter." (Laila) Laila's son however has a greater problem with wool itching. "But last winter he complained less. He has certainly become used to it, as well. And he doesn't complain if it's underwear in merino f. ex. Then he says nothing." (Laila) She suggests that the change could be that he has gotten used to it. This is an interesting point and returns to Per's point that we started out with. The feeling wool gives may be different than other fibres,

and this may be something that some people like, others not. It can also be something you can get used to.

It seems that the idea that wool itches is stronger among our Swedish informants, than in Norway. "One is a bit prejudiced against wool, that it may itch but then you have underwear in wool and it does not." (Miranda) "Sometimes you buy something and then it itches." (Vera) The idea that wool is an allergen is also something we encounter in Sweden and not among our Norwegian informants. "I get very warm when wearing wool and it can induce redness. But not nearly as much as when I was little." (Vera) Here we see that allergies and warmth are understood as something that goes together.

3.2.8 Warm and too warm

The property our informants talk most about is warmth. It is mentioned most often when explaining why they do not use wool (anymore). But this is also what allows many to actively choose wool. We start by looking at how wool's ability to warm is perceived positively.

What must be in wool, we ask, and usually the 'warm' clothes are mentioned. "Woollen socks. But it is in the name. Warm socks in the winter must be wool, the ones used in large winter boots. And the children, what they wear in winter under the outdoor suit. This must be wool as well. Otherwise they will be too cold." (Eva)

That wool is associated with warmth, relates to the experience of the material itself. However, this also relates to clothes that are an addition to the usual clothes or replace these for warmth. Tony starts the interview by explaining how he uses wool. "I use wool mostly when it's cold and I have nothing against using wool, I've never itched, and I have since I was a little had a mother who loved to knit so I have always had sweaters and thick sweaters. I have a couple now. I also buy socks in wool, thinner ones, typically Ulvang (a Norwegian sports brand base don mainly wool products). And then I have long-johns and an undershirt in wool. The kind one uses f. ex. when you go skiing. It is admittedly not that often that I use these, it is mostly when it's like freezing. And if I'm walking further than to and from work. If I go to and from work, I freeze for 10 minutes, and that is fine. Otherwise, during the winter, I may wear wool socks instead of cotton ones because of the good warmth. The same with the thick sweaters if I'm walking further than to and from work. I have a cold apartment floor so that means thick socks. Instead of turning up the heat. I put on an extra sweater rather than turning up the heat." (Tony). We see many examples

of wool not being the common choice, but it is chosen when it's cold, whether it is in order not to freeze, or it is to avoid heating up the room.

Tony talks about both merino and conventional wool in conjunction with warmth, however it is the traditional (cross-bred) wool he first thinks of. "The thick socks have always been in (traditional) wool and the same with the thick winter sweaters. So when I have needed (them) I have only hinted to my mom and then I get a package in the mail. Now it's a long time ago. So for me, it is a habit that it is in wool, and I do not have this kind of apparel in cotton." (Tony). Tony knows and has experienced that wool's warmth is different from other materials. "It keeps me warm and at the same time it wicks moisture. In that sense it is a very good insulating garment. Therefore, I choose to use it when it is cold. It wicks moisture and you do not feel clammy even if it's hot." (Tony). Finally, we see that he speaks of warmth from wool differently because it is not a 'clammy' warmth. The warmth is also referred to as positive. Mia would like most clothing to be in wool. "This would be winter garments, sweaters, scarves, etc. Also pants and dresses as well, it is very cold here during winter, indeed." (Mia).

Per is one of those who finds that wool is too hot and therefore something he avoids. What is needed for him to start using more wool? Per answers: "Extremely cold winter temperatures. If I were on field trip in Siberia or something. That said, I have borrowed wool clothing for skiing in Inner Troms (very far north in Norway) once. So under those kind of circumstances I could use wool. But in Oslo, it is never appropriate." (Per). That wool is too warm does not only applies to sports. "My brother has bought a national costume and it's the first thing I think on 17th of May, that it must be awfully hot - the comfortability around temperature is very important to me." (Per).

Many think like Per, who does not like the feel of the textile (as we described under itching). Even the finest wool fibres are not something some of the informants would wear even if they don't think it will itch or be too hot. There are several ways to understand this. One is that the same warmth some perceive as wool's strength and that is the core of their love for wool or sense of well-being, is precisely the same feeling that others do not like. It is also possible that someone who does not like to be hot, such as Per, also doesn't like the warmth the fabric surface has - even when it does not make him too hot.

We also have informants who like wool as something 'warm', but still in many cases experience that wool is too hot. One of them is Mikkel. He says he wears a lot of suits. "Also in suits wool is used a lot. But I'm the kind of person who quickly becomes warm. That is to say I am very hot. All year round. My wife

calls me the radiator. So wool is also a bit problematic for me, it makes me boil over." As part of his job he holds a lot of "lectures or workshops, where the body temperature increases. And then I consider what to wear in the morning: Today I'm going to boil over, so I choose something lighter."

Mikkel also uses wool for sports, but chooses "technical garments that help to keep the temperature down. I am a jogger, so I become very warm when I exercise. When I run outside during winter, wool works fine. But for indoor exercise then it is quite impossible to use wool, I would have fainted. I think." (Mikkel) That he says 'think' is interesting. None of the informants talk about the use of wool for indoor exercising or training during summer. However, he is not sure and says "I also know that, behind the knowledge that wool has so many features that other fibres do not have, I wish that thinner wool with more breathability was more accessible." The problem is therefore not just that wool is too hot, but the way wool is used and marketed is associated with warmth.

How warm the clothes need to be, how much clothing one needs, has to do with many things such as culture and habit, but also with the temperature both inside and outside. "It is quite hot indoors in Sweden, always. In the winter. So we don't need to be so warmly dressed." (Mille) We have previously discussed warmth in a comparison between wool use in Norway and the UK, where we also compared the inside and outside temperatures. We perceived the fear that we met among the English informants related to being too warm, as something typical British. We see that the same fear is also present among our Norwegian and Swedish informers (Hebrok & Klepp, 2014). Closely associated with the perception of wool as warm or too hot is that it's something you use during winter.

Not everyone saves wool for winter. "No it is not only for then (winter), I have my cardigans year-round and I use my wrist-warmers year around as well." (Vanja) "And if it's cold at night if you sit out a late summer-evening. Then I use wool socks. And at the camping ground I sleep in wool." (Emma) "Yes, I may well have a wool scarf or woollen sweater in the summertime to wear when I sit outside in the evening and stuff, but I do not wear woollen tops during the summer. Socks, however." (Sara).

3.2.9 Knowledge and prejudices

Astrid sleeps in wool underwear all winter. However not in summer, not even at the cabin, where she sleeps in a small cotton jersey. "But really, when I think about it, I should rather have slept in the woollen undershirt even though it's hot because I believe that it's too hot, but that isn't right. (Laughter.) One has

an idea that wool is warm, that wool provides warmth." Here we see that talking about, and thus reflecting on a practice in itself can help to change it. Astrid has as before mentioned problems with temperature regulating, yet she does not use a wool top all year round, but changes to cotton. This we can understand as the idea that wool belongs to the winter and is 'hot' in a way that supersedes Astrid's experience. Once she starts talking, and therefore reflecting about what she does and how she experiences this, it becomes obvious to her.

Also Vanja has knowledge enough to know that wool does not have to be warm. Her first reaction to how it will feel to sleep in wool, though, is that it will seem too hot. "I'm a little nervous that it could be warm. But on the other side it's the quality of it. I think it can work. I mean some types of wool are cool actually. So it can work. If it is done right." (Vanja) It is as if she has a discussion with herself in the same way Astrid had, where knowledge of wool and prejudices about what wool can be used for, are weighed.

Overall we would say that the informants have much knowledge about wool, which is better than the general low textile competence. In what they say, the informants mix things they have heard and read, with their own experiences. A good portion of the wool characteristics such as warmth and felting are very well known and extensively discussed in the interviews. Other properties are not mentioned, f. ex. the ability to over-stretch or low flammability. In promotion of the individual properties it will be important to think through how one can simultaneously display both the breadth and flexibility of wool and its properties. Warmth can be perceived both positively and negatively for wool. The same applies in relation to hygiene to a large degree.

3.3 Hygiene

This report's main focus is barriers for a 'wool bed'. And while almost none of our informants think that itching will be an issue in relation to sleepwear and bedding, wool hygiene is perceived as a possible problem. Therefore, we will treat hygiene in more detail. The fact that the informants are generally more concerned about this than other issues, makes it an important point. We will come back to laundering of bedding in the chapter on this, where the hygiene barrier against wool in the bed is discussed. Here we will look at how wool underwear is used and laundered. Given that it's underwear the informants already have experience with, their practices surrounding this can contribute to the discussion on how they envisage sleepwear and bedding relative to hygiene. However, before we start this discussion, we must say something about what underwear is.

3.3.1 Next to skin

"Right now, I'm a toddler dad so it is very 'wool for the children' both thin wool and thick wool, so I'm concerned about the innermost layer of clothing. It is top of mind." (Mikkel). Mikkel is - like many other Norwegian parents - concerned with 'the innermost layer'. This is also important in discussions about proper attire in sports and outdoor activities in cold weather. However, this innermost layer seems to *not be* always next to skin, after all. Here is a conversation with another father of young children; Ove.

The baby has a wool body over the diaper, but when the diaper goes, so does the wool body and a new garment emerges. "When he stops using a diaper, he will use cotton underpants. Then, basically, cotton will be next to skin and wool over." The interviewer, in this case Ingun, cannot contain herself.

Ingun: But it has not struck you - or your wife...?

Ove: No I have not once had the thought, before sitting here now.

Ingun: That he sits...

Ove: ...in ice water quite simply.

Ingun; ...with his cotton panties on.

Ove: But he fortunately has more than a cotton panty on.

Ingun: But it is now underneath the wool.

Thus the conversation continues about small children and warmth, and Ove defends the practice with the argument that "little children are hotter", and that might well be. However, this argument does not gel with the emphasis on 'the innermost layer'. A bum is a large central muscle on the body that easily gets cold when sitting in or on something cold, and easily gets wet whether it is through that we are sitting on, or something that could come from the inside. Ove practices the same way of dressing for himself. With "a cotton boxer inside" the long wool long-john.

Ingun: And how does that help?

Ove: It keeps me cold and wet then obviously. (Laughter.)

The above exchange is not unusual. The 'underwear' we discuss is a wool long-john with a boxer or briefs under. We will therefore divide the discussion in two. First we will talk about laundering underwear in general and then we will attack the innermost garment: The boxer/panties themselves.

3.3.2 Less smell and stays clean longer

Roy touches the underwear we have brought with us, from Aclima. "This reminds of the running jersey I have when I go jogging. It feels a bit thin. Unlike other apparel one generally has when exercising, which smells horrid, even when they are clean, the moment one gets hot they smell really bad. But this jersey I could wear three days in a row. Without washing it. I can just air it in moist weather." (Roy)

Kari uses a lot of wool and is well aware that wool does not smell. This is both a personal experience and knowledge she has. She is the one who washes wool underwear the less frequent. She launders wool twice a year at the most, maybe only once, and regardless of how much she uses the clothes. "I never feel that they are dirty." (Kari). But when the winter season is over so she washes all her underwear. She has a panty in cotton and a bra that is not wool under this wool underwear.

That wool smells little is relative to something that smells a lot or more. "But it's also an experience with scarves and hats in synthetic fibres; they can look very nice but then quickly the nasty smell emerges. So I'm very sensitive when it comes to smell. *Very* sensitive. So abhorrent is the smell, that a scarf that someone has worn even a short while, yikes! Smell is important." (Astrid).

3.3.3 Laundering frequency

Frequency of laundering of wool underwear varies. It varies from Kari's practice, with laundering once or twice a year, to those who launder after each use. How often these garments are washed, is related to their use. "What I have closest to skin for two or three days, it depends on the use. If I've used it for exercise I wash it immediately but if I've only used it to go to work, I do not wash it as often." (Sara). Is there a difference between a singlet in cotton and wool? "Yes, I think wool stays fresher longer. The self-cleaning effect works. But cotton I think quite quickly becomes disgusting and should be washed after each use." (Sara). Mikkel disagrees partly: "Laundering? If things are used for exercise, they are washed after each use. But if it is used daily on cold weekdays, not as often. When something has been wet with sweat it needs a rinse." (Mikkel). This is a common belief despite the research that suggests that wool can lose the sweat odour through airing (Kjeldsberg *et al.*, 2012). This is an experience that is well known through leisure activity. "At the cabin this is perhaps different, when you use the clothes for several days, but you hang them out to dry. They don't lie in a wet heap on the floor. Then it's disgusting to put them on the next day. But when they are dried it feels all right." (Ove). It therefore seems as if

the informants both know about wool's ability to release odour and use this to some extent, without maximizing this property.

Informants with little wool will launder wool less frequently. Mona is one of them. She uses wool for shorter periods when she "washes wool slightly more often than once a month during the winter. As you use the clothes for short periods and then you take them off and then air them and then you put them on the next time you go out. And the point, is that they do not smell, they do not absorb sweat in the same way, so laundering is much rarer than for other garments." (Mona).

There are more reasons to launder than the smell of sweat. For toddlers clothing represents quite different challenges. "Because kids get dirty all the time. Yes, the youngest changes clothes every day no matter what. And he wears wool underwear for two days as he does not soil himself anymore. What he wears on the outside of that again, it washed all the time." (Ove)

3.3.4 Laundering program and wool detergent

In Norway there is a clear and simple standard for a wool laundering program which most are familiar with. "30 degrees and Milo." (Mona); the result is no problems with shrinkage or other issues. Even Per, without a single garment in wool knows "that wool must be washed on special wash cycles, but given that I have no wool this has not been an issue, but I assumes that most washing machines have a special program for wool." However, the issue that wool should be washed separately, or at least in a certain way, can itself be experienced, if not as difficult, as "a little stressful. One is supposed to use a separate detergent and cannot throw them in the 40 wash with the other clothes". (Cecilia).

Milo virtually reigns supreme in the Norwegian market for wool wash detergents and is sold in all grocery stores. Lilleborg (the manufacturer) also advertises a lot, most famously they have collaborated with Vegard Ulvang (cross country ski hero and figurehead for an iconic wool brand) and recently Kari Traa (freestyle ski-champion and figurehead for a sports brand for women). The advertisements are both informative and at the same time humorous and have undoubtedly helped to consolidate Milo as the number one choice for wool laundering. Or as one of the slogans claims "everything that can tolerate water also tolerates Milo". Milo is available in a normal edition in pink and with perfume, and a newer variant which is colourless and unscented. Milo is used synonymously with wool detergent in the same manner that some other trade names are included in the vocabulary as a generic designation.

Not everyone is completely satisfied with the recipe "wool program and Milo". Sara is one. She wants a more powerful and agitated wash. "I look at the washing instructions. If it's 40 degrees I launder using the 40 degree program with Milo. And if the label says 30, I use the wool program with Milo. You can set the wool program on 40, but I think the wool program is so incredibly gentle. I think that if the clothes can withstand 40, they can certainly tolerate a tougher cycle. I wish that they could be washed at 60 degrees." (Sara)

Tina is also not happy. "I think the laundry programs do not work. No, the wool program washes too gently and too poorly. And the other programs are too tough. Fine woollens are fine to launder but not thick woollens. They generally don't become clean. It does not work properly." Felting? we ask. "No, not nowadays. That was before, but if I wash by hand the woollens become clean and nice. But if I buy someone like a sports woollen top, they can be machine washed without trouble. That works fine." (Tina).

The informants are the least satisfied with stain removal. "I have young children. And it's a bit annoying when you cannot wash the clothes. Some things you can the wash at 40 degrees. You are supposed to use a wool detergent and then you do not get the stains out. Unless they are laundered at high enough temperatures and with a stain remover. (...) But wool also has self-cleaning qualities..." (Sara) Typical for the responses is Sara's somewhat hesitant way of describing this as if she is not quite sure. "When chewing gum fastens onto the woollens, I become despondent. A typical stain removal problem." (Kari). This is both because it is hard to get off and because she loves her woollens.

3.3.5 Swedish wool laundering

Among the Swedish informants, wool laundering is more varied. Some do as the Norwegian informants. "I think it is fairly easy to launder wool. I don't do it very often. I now live in a house with a balcony and it is very easy to air the clothes outside. And the washing machines where I live have a good washing programs so I launder the clothes mostly in the machine and it's super easy, I collect some woollens and run the machine with wool detergent and the wool program." (Mia).

Miranda explains that she washes "underwear in the machine at 40 degrees with a normal detergent. I know that one should actually use a special detergent," and even if some Swedish informants use a detergent for delicates, not everyone does.

Roy wants the clothing to last and is careful with how materials and clothing are treated. We ask him if it is difficult to wash his woollen underwear. "No. Not really. Because they can be laundered at a high temperature and some can even be tumble-dried carefully." Do you? we ask. "No, I always hang them up, I don't dare to tumble-dry." He washes using the wool program, or a short program (20 minutes), but with a regular detergent. Why? we ask. "Because I don't have wool detergent. I didn't know it existed. When I buy detergent I'm concerned that it should be a gentle detergent without perfume, that it should be environmentally friendly and without allergens. So those are the premises. I may have some difficulty in changing habits. When I have found something that I think is good, then I just choose it. I have not seen if there is something new on the market." This does not apply only to detergents. "I always buy the same coffee. If I find it. That is also an active choice. It should be Fairtrade, and it should be organic and medium roast. So the choice is limited." (Roy) His reflections are pertinent. Consumption is often a manifestation of routine actions. The conscious choices are not made every time you are in the store, but once in a while. Thus it becomes a big question why the 'routine' of wool being laundered in Milo dominates in Norway, while Roy is ignorant about special detergents for wool, or even the fact that wool should not be washed with a regular detergent that includes proteases (enzymes that degrade proteins).

Charlotte often washes sweaters and cardigans by hand. "But this underwear, they go in the washing machine." A wool detergent, however, she does not use, "but when I wash by hand, I use Y3³. It is a little gentler." (Charlotte)

We have previously written about three of our Swedish informants who swear to 'untreated' wool, which for them means wool without 'super-wash' treatment. Irene believes the untreated wool is preferable when it comes to washing. "I can't get rid of stains on the treated wool, I throw it in the machine since it can withstand the machine-treatment. But despite of the washing, I do not get the stains out." The untreated clothes, which is what she uses mostly, she only hand washes. If necessary, she can then use soap on the soiled spot. "It as a kind of meditation when you are hand washing," explains Mille. The washing has become easier by the fact that she "can spin the clothes and then it is much easier to hang them to dry and stuff. Easier than before when I used newspapers and towels and rolled the clothes up". (Mille)

We have too little knowledge about the Swedish market for wool detergents to explain why fewer use wool detergent and how this is connected to the methods for laundering, which also appear more varied. The Y3 detergent is for finer

³ Y3 is a laundry detergent for delicates wash in Sweden

fabrics, including wool and silk, so it is perhaps not seen as a specific wool detergent.

3.3.6 What one does seldom is complicated

Cissi owns no wool, but recalls wool washing as problematic. "I find it difficult to launder. I've felted a sweater once... I cannot remember if it was that it was because the water was too hot or it was because I centrifuged ..."

Tony explains that "the reason why I do not use wool more often is that it has to be washed separately. And I like to fill up the washing machine, and I may have used some wool socks and not anything else in wool, and they lie around for a long time before they are washed. I need to collect more than just the socks, you could say I have a problem as I do not hand wash". Because he does not own much wool, the wool he has is not used. It becomes impractical to wash. Tony himself sees this as a result of that he does not wash by hand. In addition, Tony has a slightly old-fashioned notion of how wool needs to be washed that also makes the laundering more problematic. "So when I have used it (a thinner wool sweater) a few times, I can launder it in the machine. But the timing has to be right. And I have to dry the sweater flat and stuff so it's a little more complicated."(Tony).

As the knowledge about wool laundering is low, resulting in procedures being unnecessary time-consuming and inefficient, along with this being rarely done, wool *becomes* difficult to wash. For those with lots of wool and up to date information, this contributes to wool being used longer and laundered less, with a longer time-span between laundering and thus perceived as easier to care for.

3.3.7 Boxers and panties

When very many answers are the same, we become curious. The question we asked where answers were most similar, was: *What, if anything, cannot be in wool?* And the answer was underpants/boxers/panties. A few also responded swimwear. We'll let swimsuits lie, although wool swimwear was common until the synthetic revolution, but why panties/boxers? What makes wool unfit for this garment? Or more precisely, why are panties/boxers the garment most often associated when the question of what cannot be wool? Already we have seen that parents of toddlers' focus on "wool next to skin" is not actually next to skin, but in reality a potentially cold little panty (if it gets wet) which comes in between the warm child's bottom and the cozy wool underwear. And this applies not only to children. We will warm up with three wool-lovers who still cannot imagine wool panties - at least not spontaneously.

What cannot be wool?

"Panties. (Laughter.) No, that is the only thing." (Mona).

"Panties. Not a swimsuit. Although historically there were knitted swimsuits, I'm still very suspicious." (Agnes)

"Bras even, a sports bra. But somehow, wool panties even, but each to their use. I would not have attended a ball in a woollen dress. But a nice dress can be in wool of course. I cannot think of anything else that cannot be wool." (Sara)

We could have continued with this theme, but prefer to look more closely at how our wool-lovers talk about the non-choice of wool panties.

Astrid *lives* in wool during winter: "Underwear during winter, next to skin, anything else would be unimaginable. (...) Tights under trouser during winter when it's cold. They have to be in wool ... " She does not "feel I must wash wool so often. Definitely not! Tops that you sleep in at night and then wear for many, many days, they never smell." Astrid uses her wool underwear night and day for 6 -7 days before she launders. But she always has a small panty in cotton under the long-johns. Why? we ask. "Because I have not seen wool panties," is her immediate response, assuming that wool is not easily accessible in the market, but she continues, "and there is the laundering. This may be mistaken; wool may have properties that makes it okay to wash at 40 degrees"

Lise agrees that washing frequency is the problem: "The advantage of wool is that there is no need to wash it so often, but a panty you have to wash after every use, so I think it's inconvenient more than uncomfortable. I think it might be really good for someone who easily gets a cold butt, like me. But I prefer what sits on the bum to be cotton. Due to practical reasons."

3.3.8 Heat and hygiene

One of the many who answers 'panties' to our question on what cannot be in wool, is Eva. But she adds "at the same time wool gets ... it's like antibacterial. I'm still sceptical though". (Eva). That wool is antibacterial is wrong, but we do not think she knows this and we do not think that's the reason she's sceptical. Wool does not kill microorganisms, but it has inherent properties that reduce odour formation (McQueen *et al.*, 2008). There are two important prerequisites for briefs being mentioned as example for what *cannot* be in wool. Both these prerequisites are wrong. The first is that the temperature of the water is what guarantees clean laundry, and the second is that wool cannot withstand high temperatures. Both premises surface in what Miranda says: "All textiles that I

want to occasionally boil are not wool. So I have no underwear or panties or next to skin apparel in wool, but I know that wool is a good choice." She says that she "knows that wool is partly self-cleaning, but still ... the same with kitchen rags and cloths and stuff, I launder these at 60 degrees". (Miranda). Again we see that she knows about wool's ability to keep itself clean, but that she does not trust this. How she "knows" that wool cannot be boiled and that temperature is so critical for cleanliness, she does not say, but she is very sure of the veracity of this relationship.

Not a panty: "It's a bit like, personally I'm thinking of hygiene, feminine hygiene. I don't have any (wool underwear). Mine are cotton and tencel." (Kari). Why wool does not fit in with 'feminine hygiene' is not anything we pursued. Miriam summarizes this well when she answers: What is needed in order to use more wool? "If I was assured that it would be perfectly clean. At 30 or 40 degrees, I would consider wool underwear. I had to be convinced it was absolutely clean, then I could be convinced to buy more wool."

3.3.9 Aclima's boxers and panties

Vanja is one of many who mentions briefs in response to what could not be wool: "I would probably doubt panties. Because I would want to wash them at 60 degrees and run the machine on a tough program, which would make me think twice." Many of the informants however became a bit more positive when they saw the Aclima's under-wear: "Are these wool briefs?!! Hmm, yeah. Are they 100% wool? (Laughter.) Yes, wow. This could work! It feels as if it should ..if they could be laundered at 60 degrees, then yes. They feel very nice."

"This I have not seen before. This can't be wool? Is it? Whoa! It is very nice. I had not really thought this was possible. This one had been nice to ski in." (Mona). "These feel like any other garment," says Mona. But still there is "the problem with laundering. I had probably laundered them at 60 degrees and seen what happens. But I probably would not do it every time, but like every other month, as I switch between different clothes. There are areas you sweat a lot, and therefore you wash more often, and that's where it becomes a mismatch with wool. Possibly it is a mental block." (Mona). Could you use these? we ask. "I'd like to test. I have not seen anything like this before. The label actually says 60 degrees, but ..yes it looks cool, so nice! This must be for when it's minus degrees. I would wear them when I tend to wear my wool, for skiing and as part of the Norwegian DNA, that is when you should wear wool." (Mona).

Agnes is thrilled with Aclima's woollen panties: "Excellent! So nice! But I would probably have liked to have them in a different material. Underwear requires washing differently, at low temperatures and ... underwear should be laundered in hot water and often. I think it is different with a knitted wool pull-over that you have outside other clothing compared to what you have next to skin. So I don't think wool's ability to cleanse itself is optimal in under-garments. I would probably use these here as a type of pantalettes that I would have panties under, which I do in the winter. Like what you buy in health food stores, that kind of wool pantalettes. The closest I have is a pair of cycling shorts but in wool, but then I have the panties and often tights underneath and then maybe a dress over that. When it is really cold, when it's winter, it's wonderful to have." (Agnes) Agnes will therefore use the wool panties over other panties and possibly also over pantyhose.

Most are very positive, and actually surprised by Aclima's panties. But not Vera. "Under-pants (in wool) I feel will be hard to have next to skin. But I have a nightgown (in wool)." Have you seen these? we ask and show the panties. "No. Not like that in wool. One has seen long-sleeved tops though (in the same material). But this material... It has a different feeling than cotton. But as pantalettes, pants outside underpants to keep warm, I'd wear these if it's really cold." But not next to skin: "No, I want (the garment) to feel smoother in a way." But if you had cotton under? "Cotton under, I might consider. For it would be nice and warm." Is it the surface you do not like? we ask. "Yes it feels even a little prickly, I cannot explain it. It feels in a way that there is something sticking out more than in a cotton fabric." Vera uses little merino wool and next-to-skin wool, and possible this is the same issue we discussed in relation to warmth, that it is the actual warmth, or 'feeling' that Vera calls it, that is the problem, more than anything else.

3.3.10 A warm wool panty enthusiast

The informant who definitely had the most briefs in wool was Laila who has a Norwegian mother and Swedish father and lives in Sweden. Laila has 10 wool briefs and explains:

"The one I am wearing now I purchased in a wilderness store in Sweden, but the ones I've had all along, I've had to buy in Norway. There is not a large supply of wool underwear in Sweden compared to Norway." Do you use it just for sport? we ask. "No, during winter in general. It gets too warm during summer so it's simply not possible to use (wool) then, but in the winter in particular when outdoors, when moving around and getting a little sweaty. That they

started to make lingerie this way is rather recent, earlier the underwear was always a little sweaty" (Laila)

Laila does not perceive laundering as a problem. "I wash (woollens) just as often, but I wash them at 40 and not 60 as I do with the other garments, but then the (woollens) keep much longer so I should maybe wash the other garments at 40 but I do not, I use them and throw them away more often, the ones in cotton."

Mia has not heard of wool panties before, but "I'd like to try because I think that briefs in wool would be very nice" (Mia) and she does not consider them for sports but wants rather something that fits her vintage wardrobe. Also Sara wants a pair, but not for everyday use but for sports "so when I go skiing so that my thighs and my bum can be warm. So it's actually on the wish list." (Sara)

3.3.11 Men and boxers

Wool boxers was not something the men we spoke with had any experience with. "Boxer? Immediately I think that it was certainly not a good idea. That it would be too hot. Around the private parts it would be too hot and unhygienic." (Mikkel). He knows they exist, and like many of the ladies, Mikkel is amazed at how thin and light the garments seem. He "does not feel that they are easily accessible. So if this is wool I would think that I could use this, if this is merino". We try to understand what he is actually saying and ask what he means by hygiene. Is it because underwear should be washed at 60 and 90? "No. I never do that. No, it's more that in everyday life, one would walk around and be very sweaty. If (wool) transports moisture. But I am only repeating what I associate with wool boxers." (Mikkel). For us it seems that the associations he gets when he thinks "a boxer in wool" is something far thicker and heavier, and thus warmer than the garments he then sees. Therefore, it is probably not enough to hear about such products, one needs to see and feel them as well. The same point probably applies to bedding and we will come back to this when we dive into the bed.

3.3.12 Bra

We also showed a bra from Aclima with wool terry on the inside and synthetic material on the outside.

"It's brand new ..fun! So you have the synthetic against the skin? No ... and it does not itch. Whoa. Stylish." (Mona).

Sara says, "This certainly is not such a bad idea. Very smart as tits are also quite cold when you get wet and sweaty. Certainly something I could consider buying." (Sara).

"A bra? Very comfy, I would like that. I haven't owned a wool bra. It being a sports bra is also nice, as wool underwear for women tends to be rather flat and I want to build up the upper part, so I need a sports bra under for a good fit." (Emma).

"I have purchased two woollen bras. But not been happy because I got a pain in my shoulders by wearing them. I have pretty sensitive shoulders. Yes, this is the one. Also a 60's style with a zipper. But I want a classic bra with cups as well. But this one is more like I had with the zipper, but I think it is thick and stiff." (Barbro).

But we also have a happy wool panty-user who wears hers in "the mountains or similar setting. They are so comfy. Yes, you wash them as you do other panties but maybe not in 90 degrees. But that works really well and the best thing I've bought is my woollen bra. Wool underneath. Delightful," says Sandra.

We see that the reactions to this particular bra is varied. Which is only natural. However, most are positive to the idea of wool in a bra.

3.3.13 Underneath "next-to-skin"

It's a somewhat surprising that the focus on the "inner layer" hasn't resulted in a more extensive debate or reflection on what materials that lend themselves to briefs and boxers. This is not based on a lack of knowledge about warmth and moisture wicking. Knowledge gaps appear to be larger in terms of what contributes to cleanliness. Very few had heard of this kind of wool underwear and most were surprised the garments are light, thin, soft and with such a 'normal' appearance. It is one of wool's major advantages that it can be washed less frequently – but this is an argument against using wool in this kind of products because they 'must' be washed after each use. Thus, the logic suffers. The woman who wears wool panties, washes them after each use, but experienced that they last much longer than briefs in other materials. Our informants do not seem ripe for discussing the 'laundry after each use' norm. It is as if frequent laundering at high temperatures guarantees cleanliness, just as the use of briefs guarantees decency.

It also appears that informants are not confident in their perceptions about hygiene, odour and purity. This could be a good starting point for change.

3.4 How does change occur

A main point of this report is to examine the barriers for a change to more woollen bed textiles in Norway and Sweden. We have therefore been concerned with how informants describe changes in the use of wool. We think there is something to be learned from the changes that have already taken place, and how the respondents think about what it takes to induce change. Later we shall discuss change towards more wool bed textiles more specifically. Most informants talked about a change from a traditional use to more use of merino. But how has the change come about for them?

It appears that a general feature of change to an increased use of wool happens gradually. Knowledge and experience from the use of wool in one context, forms the basis for a desire to use wool in different contexts. So the knowledge and the positive experiences wool offers through use, can also form a springboard into new areas. The informants talk about many different ways such an increase can come about, and we will now take a closer look at this. Then we will look at what they think about the importance of availability and advertising, how the industry helps to change behaviour - seen with the informants' eyes. Finally, a few words about what prevents change towards more wool use.

3.4.1 From child to adult

Irene says: "I have not grown up with wool. Back when (I grew up) synthetics were the norm. So this is something that has developed over the years. I began to dress my children with wool underwear, I've always bought this for the children, as next-to-skin. But to dress the kids all the way through in wool, that started when (the two year old) was small and then I started to dress myself in wool to understand how the children were dressed. To easier understand how many layers were needed for different temperatures and later I have considered a return to cotton, and it doesn't work. (Laughter.) It does not. (More laughter.) I cannot."

Changes in consumption happen more easily when other changes occur at the same time (Shove 2003). Having children is a situation when a new consumption praxis can be established. But Irene did not start when she became a mother, rather when her 6th child was small. The eldest child of 15 had underwear in wool, but "not when he was little, I started buying when he started to

move more, in preschool. But basically, that was the easiest to get hold of, which was *Polarn o Pyret*." (Irene) Therefore it is clear that both the desire to do things right (or politically correct), in relation to children, and the ability to obtain relevant products, is essential. And as Irene has said elsewhere in the interview access to wool clothing was also through Internet shopping, e.g. the Norwegian site for *Nøstebarn*⁴.

One of the Norwegian informants, Lise, talks about the same 'journey': "I do not think I had much access to wool clothes when I was a child, I remember we had those painful tights, which were probably quite synthetic." The next-to-skin wool came on the market after she had grown up, and her journey started when she had her own children. "Especially in connection with having kids and knitting wool diaper-panties and stuff. I do not think I had any proper wool clothing before I had children. When the oldest was born, I got a sheepskin that we had in the buggy, and I have been partial to homemade stuff, and good, proper materials. I discovered *Nøstebarn*, it was brand new then, the ideal was to have natural fibres. And we liked it. Hand-knitting became a trend, but you can go into any chain store and expect to find wool. So I think most people prefer wool for children if they do not have problems with wool." (Lise) Again we see this mix of experiences and access to the market, and during a period when she was orienting herself as a consumer.

Mia does not have children, but has worked in a children's clothing store "*Polarn o Pyret*, they probably didn't have wool pyjamas, but they had a lot of good clothes and thin wool underwear and wool terry, and I wish the clothes were for adults," she says. Existing garments for children got her to wish there were similar adult versions.

Children's wear has been and is something mothers take responsibility of. This becomes clear in the interviews. "Children's clothes. Yes, like all other men I am ... a little out-sourced, maybe." Have you tried to get involved? we ask. "No. But I am consulted occasionally." (Ove). So if this kind of increase in wool use is important it will probably happen more through women than men. Both informants above are women. And there is generally a tendency that women have more and use more next to skin wool. Several informants tell of more wool use among women than men. Astrid talks about a greater variety of woollen garments for women: "Underwear and undershirts and you can get very delicate things, with lace trimmings. But I do not know what the guys wear, they wear more t-shirts in cotton and wool over, and then there's wool for sport."

⁴ <http://nostebarn.no/>

If this road to more use of next to skin merino is important, it will be more relevant in Norway than in Sweden because of a greater acceptance for baby wool here. We'll return to this.

3.4.2 From sport to daily life

"As an adult, and especially the last few years I have started to use a lot of wool not only as ski and active wear but also as everyday clothing. Knowledge of and access to clothes that I like, which are nice or trendy or sexy or whatever, is important. And the more I use wool, the more one becomes fond of it. This also includes my husband who all summer has worn his two *With & Wessel* wool t-shirts, and that's been like: why should I use it just for sports? A very nice experience for him." (Kari) Kari here talks about a transition in the use of wool. She and her husband had used traditional wool and merino for sportswear. But not in daily use. This change was based on market knowledge, and knowledge about wool. The change is as Kari describes irreversible in the sense that they are not going to go back to daily attire in other materials.

Important for this change is what is actually offered in the market. While sports underwear in wool has determined both the design and the use of this type of clothing, it is unlikely that daily attire for adults is affected as easily. This is obviously just a hypothesis, but as Kari says clothes that are "nice, trendy or sexy or whatever" are important. I.e. clothing that fits our our daily lives. Barbro experienced that she has had to opt out of a sense of style to choose wool, and this is particularly difficult because she did not just want wool, but organic wool. "It's hard because of the limited offer. I have a certain taste and style but I have to compromise all the time. I don't want to dress in a *Nøstebarn* style, somehow" How does she want the wool clothing to be? we ask. "I want organic but a little more '60s style. A little fun, a little classic modern. A little cool." Mia does not compromise. "The tops they look so sporty and I don't want that, I want to have regular garments. I do not like sporty clothes, and then the choice is limited." (Mia).

3.4.3 From traditional wool use to merino, via sport

This type of change was already discussed in the introduction as the dominant arena for change But that does not mean we know how this has come about. For Vanja wool is associated with traditional garments and techniques, "above all, pull-overs, cardigans, socks, hats and mittens." She has a lot of knowledge about wool and greatly appreciates the fibre. However, she still has "very little merino". To the extent that she is planning to change this, it is through sports and outdoor activities. "I have tried to convince my partner that we should go

on a hiking holiday, and for that purpose I would acquire (underwear), he is not really an outdoor person. If I was to try this out, I'd acquired the clothes." (Vanja). We see that the transition from traditional to merino goes via the use where merino dominates for most adults in Scandinavia; Sports. It is possible to think that those who are used to wearing traditional wool daily would start with merino in daily life in the way Kari described. This, however, seems as skipping a step, and that for Vanja it is through sports or else there is no opportunity for merino to enter her life.

One who has switched through a more active outdoor-life is Miriam. "I have always used wool long-johns and mittens and hats, typical winter clothing. This has not changed much, but the use of wool has. The technical. It happened when I started with more cross country and more down-hill skiing, which I didn't do as a child. I did not own this (type of clothing as a child)." Miriam talks about merino as 'technical' and thus differentiates the traditional which she describes as "typical winter clothing". Raised far south in Norway, on the Swedish border, winter sports were not a large part of her childhood. Now that she chooses what she buys, and is more active, merino is more a part of her wool use.

3.4.4 From person to person

Laila's husband is Swedish. Before they got together, he did not have a lot of wool. She says that he is interested in motorcycles. "Before he met me, the season was shorter than he wanted it to be, because he thought it was too cold and then I came along and half Norwegian as I am, I said but why don't you use wool underwear? And so he bought it and he understood the point right away of course, and so he bought more. So he uses wool underwear most of the time when he rides a motorcycle. And woollen socks as well." So it is you who have influenced him? we ask. "Yes, and he's very happy about it. He rides the motorcycle much longer now than he did before (laughter)." (Laila).

Laila has influenced more people. She says that when she had her baby, Gothenburg experienced a rare icy winter. "And my friends here in Sweden, they could not get hold of down comforters or wool underwear for their babies. And it was problematic for them to get out at all. Because we could not get it here, I recommended to my friends to order underwear from Norway or to contact someone they knew to buy." (Laila). For Laila it was not necessary to be inside all winter even though she had a new-born and even though it was freezing cold, she contributed not only to friends buying wool, but also to them following the Norwegian proverb "there is no bad weather only bad clothing". Dressing better was a 'Norwegian' alternative to restricting motorcycle riding to warm days and to remaining inside in the severe cold. The alternative to wool in these two

narratives are not other textiles but less outdoor activity. Since we here have used Laila as our example, the heading could also have been 'from Norway to Sweden'. However, there are obviously a number of ambassadors who also operate in their own country.

Barbro also tells about individuals who can make a difference. "Yes it has increased more and more. When I was younger it was really cotton that ruled. Since then, I cannot say what it was that did it, I discovered wool more. I was in contact with the anthroposophist movement and a fashion designer named Pär Engsheden. He is famous in Sweden anyway. I met him one day and he said nothing beats wool and then he laughed in a very self-assured manner. As if he knew. And it gave me the extra push." (Barbro).

3.4.5 Through interest in tradition and craftsmanship

Swedish Roy is one of the newly converted wool-users and he "uses more wool than any other person I know. I have more than any I know". What was it that made you start? we ask. "It had to do with my work. Through working with old houses and those who are interested in older techniques, older history. They are also often interested in natural materials. We use natural materials in the houses. And on humans. So it's there, in the meeting with other artisans, that I have seen that they have this type of garments." He has learned from other colleagues, but their interest is again founded in a broader interest in craftsmanship and materials. We recognize an interest for durability and materials' various characteristics throughout the interview with him. Also here we see change going from person to person. He has learned from colleagues, and it does not stop there. Have others taken after you? we ask. "Yes my wife gladly borrows my woollen top." (Roy).

3.4.6 Knitting

Any change? we ask. "Hmm, I do not really think so, I've grown up with it and wool next to skin is best. I feel I have worn wool my whole life but I feel that after I started to knit more and knit for myself, I started using it even more as it's even nicer to use things you have created yourself. (Laughter)" (Sara). What is needed to create change? "If I lived somewhere it was even colder. If I had more time to knit (laughter). (Sara).

For many of those we spoke to, textile handicraft techniques were an important contributor to their increased interest in wool. "When I was young, I was not as aware. And as I began to knit myself... "(Mille).

3.4.7 Wool as normal

"If they had been more common I had used them more." Cecilia about wool panties. This may seem like a cyclization, but the reasoning also says something else. Namely that much consumption is not based on conscious choices, but routinization actions (Gronow & Warde, 2001). Thus what becomes normal, is what deliberately is deselected, and not vice versa. Lise is onto something: "You can enter any chain store and expect to find wool. So I think most people prefer wool for their children if they do not have any problems with wool." The change towards more woollens for babies and toddlers has tilted over from being something someone chooses, as we saw Irene talked about, to what must be deselected. It's like a ski trip, first you have to go up the hill, so you can slide down again. The pace of change is thus far greater from the point it tilts.. We would very much like to have examined this 'tilt' better. It is beyond this report's framework. However, this is a rare example of a change in clothing culture, which otherwise appears to be very traditional and static.

Irene does not feel that wool is the norm. On the contrary, she has problems with acceptance of her way to dress her children for school. But she says she gets support from "neighbours; who have children my age, who had wool when they had children, and who dress in natural materials, so there is some support. And anyone else who would like, but who cannot, who get plenty of clothes for their children, and don't decline, having all the free clothes instead of (wool)". Since the child inherits clothes, thus getting "free clothes" as Irene describes, there is a conservatism in children's attire. Although parents want to dress them in wool, it's easier not to 'decline', but receive and use. It is also possible that the child who has cotton clothing has used more wool, but that these clothes are used more and thus too worn to be passed on. Therefore, cotton clothing possibly accumulates in the form of clothing that is inherited. This is an interesting perspective. A large amount of children's clothing is inherited in Norway (Laitala & Klepp, 2014). However, it is of course possible that the inherited clothes are not being used. It is also possible that inheriting counteracts this change we have discussed.

3.4.8 Hinders change: Warmth, type of apparel and price

Perhaps the most important prejudice towards wool that we have seen among informants is that wool is warm. However, this is both attributable to the material itself but also that the garments many of those who use little wool have experience with are thick garments made exactly for warmth. When we have showcased the thin wool underwear, many are surprised and that it is so thin also leads them to think it's not wool. Tony is among those who does not use

much wool because he does not need warm clothes. We asked him what cannot be wool. "Yes I've been thinking about it before you came and f. ex. underwear, boxer shorts and stuff like that and like this job shirt here I cannot imagine that in wool, it would be too hot. When you are only going to be indoors in a room-temperature environment. I cannot imagine that I had worn a t-shirt in wool at a concert. It would be too hot." The reaction to the underwear is that "it feels on the whole ok, but it depends how warm they are. But the first impression is that they are not so bad, as they are so thin." (Tony).

Lise: 'I think that all knits could be wool.' Even t-shirts? we ask. "No, I rarely buy t-shirts and I think of them as cotton, but there is the environmental aspect as well." In the popular consciousness, t-shirts are cotton. It is not a choice but a natural thing. This mechanism works both ways. That wool is associated with cold makes it the natural choice when it's cold, but thus also something unnatural when warm. Wool for exercise? we ask. "No, I use mostly synthetics. I associate wool with warmth." (Cecilie).

"If a boxer in cotton costs 100 NOK and one in wool costs 250 NOK, people will buy the cotton one," says Ove. The price has not been something that has come up frequently in the interviews except when we asked directly. We have not made any price surveys, but in Norway, the supply of cheap (and good) underwear in wool makes price seem less relevant. Probably the price difference is bigger in Sweden, at least one Swedish informant uses price as an argument against a possible transition to wool for the whole family. Roy's children do not use wool although he himself is very keen on wool both at work and for exercise. "I've thought about it, but they grow constantly. And to buy a woollen top from *Woolpower*, that is quite a lot of money. And then you can only have it one year and then it is too small. It's one of the reasons. It's an investment." (Roy) The thought of purchasing as investment we will return to in the discussion of a possible price-range for wool bedding.

3.4.9 Availability, information and advertising

There were few of the informants who had knowledge of thin merino underwear and those who had, were most often limited to thinking of long-sleeved pull-overs and long-johns. They were amazed with the quality and thinness of the small, neat garments we showed them. Thus the road was short to discussing the availability of products for many of the informants. "Everybody knows about the benefits of wool. Everyone knows that it keeps you warm when moist and it is smart to have next to skin and stuff. But I think the problem is that you have to dig to find it. You must be particularly interested." (Ove)

"I also think about availability. Because there is not very much wool underwear in the stores I buy underwear in." (Miriam) For a change to take place "there must eventually be some new products. The kind that you just showed me. I did not know that something like that existed. They have not advertised on television." (Mona)

Availability does not necessarily mean that informants will notice the products. Vanja explains: "Had I seen anything like this in the store that I go and shop for clothing, I had become curious and tested it. But I can say that I have not seen anything like this here either at *Lindex* or *KappAhl* and that's where I run in and snatch up underwear when there's a crisis at home. But it's probably just that I have not seen it. But had I come across it, I had surely bought some, for it was exciting to discover underwear in wool. To know that it exists. I do not spend so much time going into shops to buy clothes and stuff. I buy a lot of second-hand online and use what I have to pieces, so I am not exposed to what's out there in the stores." (Vanja) Agnes completely agrees. What would change things? "Availability, maybe. That the products were more common in stores. I barely buy new clothes, either I make them myself or I find them second-hand. So I may not be the best representative of consumption." (Agnes)

So far they have emphasized what is in the shops. However, marketing is important and not only what does not exist in wool, but also how competing fibres are marketed: "These synthetics for sport they have a way of marketing themselves. That makes it appear as if they are unique." (Mille)

The availability is also linked to the breadth of products. Ove says: "In the summer, I use a cotton t-shirt because the choice when you go shopping is much wider. So I can buy myself a completely black cotton t-shirt. But if you could get a woollen one ... I do not know. I think it must be steered by the options of selection when you go shopping. Had all *Björn Borg* boxers been in wool, all those you've interviewed would have had wool. But because they are made of cotton with 2% spandex, that is what everyone has. No it's certainly not hard to find if you google wool + boxer. And buy from a Norwegian online store. But if I go in a store and buy, then none of them are in wool." (Ove) This discussion is about boxers and ends with Ove comparing with baby clothes, where availability is greater. The stores are filled with wool and hence also "wool is the choice for babies." And then a shift occurs and it becomes cotton. "Or when we start to dress them like adults." (Ove)

One of those who has done much to get hold of clothing in wool, is Barbro. She talks about different sales channels in a story about what she has in her wardrobe. "Woollen tops, woollen long-johns and wool shorts, i.e. proper shorts.

Men's trousers, and tights. Woollen dresses. Now I have bought two pieces second-hand that are like a knitted pullover with a knee-long skirt, hand-knitted, ordered from Canada. One has to check around a lot. It is a hard work to obtain wool." (Barbara).

3.4.10 Better products

The market consists of marketing, advertising and that the products themselves. Many believe that better products have led to more use. "Earlier there was not as wide a selection, nor good wool types that do not itch. When I was small wool was prickly stuff which was absolutely disgusting. But now, even in the grocery store, you find wool tops and underwear and stuff." (Eva). Good products are both next to skin wool that does not itch, but also a broader selection. "Many people I know use a lot of wool and when they become aware of the availability of both fashion apparel and sportswear that is even festive." (Kari). And therefore the market will grow? "Yes, if there is even more choice in sweaters and tops and stuff like that." (Eva).

Wool as a quality material also implies that it is important that garments fit the use and users, with quality on all levels. Many believe that wool has a bright future just through the quality and durability the products can offer. "Because I believe that more and more people want quality in their clothes. And more and more engage in sports and outdoor activities like going for walks or a run like I do. Then you want to have good materials. I run quite a few miles. And then I want clothes that are wonderful and are not in the way so you get blisters or anything. I think wool is that kind of material. As more and more people do as I do, I think that wool is going to be the material of the future. And that one does not confuse wool with something that is prickly. The stuff my grandmother had or everyone - actually. And that it is convenient, nice and functional. Especially since it does not smell as much." (Roy).

3.5 Sleep

Do you sleep well? we asked our informants. And most people do. "Mostly. But now we have two kids who are awake a lot. But it's not the bedding or duvet's mistake. But sometimes I lie in my bed a little while before I fall asleep." (Eva). We shall not discuss all the possible reasons for not sleeping well, but concentrate on the relationship between sleep and temperature. Eva may have problems with sleeping "sometimes. I never wake up because I'm too cold, I'm always very warm at night. But it's more that I'm too hot and sweaty."

(Eva). We will first look a little more at the issues surrounding sleep and temperature.

Several informants experience the same as Eva; trouble regulating the heat at night. Astrid explains: "I am very hot at night and I struggle with over-heating. So I have the window open and I get cold in the early morning hours. And then I pull a wool blanket over (the duvet)". She sleeps like many of the others in a room with the window open year round and without heating so the room would hold a temperature of around 10 degrees. Also Per "sleeps very well" and tends not to wake too early. If it is "too hot I struggle with falling asleep. On very hot summer nights, not winter nights. A warm summer night I throw off my duvet." (Per).

The vast majority of our informants prefer a cold bedroom. This also seems the ideal, meaning that it is something that is regarded as right. This ideal can be formulated as follows: "Outside temperature inside the bedroom. Always window open, and no heat on. Waking up because it's too hot or cold." (Kari) And it can be illustrated through stories like this: "When we studied in Trondheim my girlfriend asked if we could close the window but then there was so much ice on the inside that it wasn't possible. (Laughter.) So then maybe it was cold enough." (Ove).

Tina says she has no problems with temperature. "No, because I tend to always have the window open. Yes, it might happen. If it's summer, I can wake because I am too hot. Or because I forgot to open the window. Or that the air is unpleasantly dense and humid, sometimes it seems like it is, even if it is not." (Tina) There are in other words situations when the window is not opened, or the opened window is not enough. Laila explains: "I like to sleep with the window open anyway. We tend to open the window in the bedroom before going to bed. And sometimes it is open all night and sometimes we close it because of the noise. For that's probably what is the biggest problem when you live in the city." (Laila) Having to close the city noises out is a theme for several. Cold and noisy or hot and quiet are the choices, and a choice must be made.

That many share a bed and bedroom with a partner means compromises. Vanja explains. "I sleep pretty badly and I have trouble falling asleep if it's too hot. So I often fling off the sheet and throw off the duvet. And I want it cold in the room and my partner wants to be warm. He has a duvet that is really thick for summer. While I only use the duvet cover without anything else. So we try to fix it that way." However, the problem is finding a bedroom temperature which both can agree on and we see here that the bedding is used to achieve this. But it also means that Vanja cannot have the big thick duvet she wants to enjoy. "The

feeling of a duvet is wonderful, but I cannot have it over me because it is too hot. And I like to wrap myself in it, but that goes against that I do not want to be hot. So the dream is to have a lot of stuff in the bed, but in the end I lie on top of it." (Vanja).

Not everyone can control the temperature in the bedroom. Barbro has "maybe 20 degrees, the land-lord decides", while others do not have a separate bedroom, and thus are not able to bring down the temperature as the whole apartment gets cold. "I have only one room. One sits there, sleeps there, such is life. Turn down the temperature? No I cannot. One can open (the window) but it is an old tenement house, but it's pretty cold because of the drafty windows. You have to wear wool socks at night." (Mia).

Although it is perceived as the best, and also by many healthiest, having it cool at night, there are many who do not due to the wishes of a partner or the housing conditions.

3.5.1 Regulating temperature through varied bedding

As we saw Vanja reduced the temperature by avoiding thick duvets. While Laila believes that some duvets are more flexibility than others. "Sleep well? Very! And it's probably because I put some money in a proper duvet." She never wakes up too cold or hot. "But my partner did before he met me, when he did not have a proper bed, but now he's ... I'm really cold-blooded and he is a very warm person, but we have no problems as long as we have a proper duvet as it regulates your temperature. So he never gets sweaty anymore and sleeps a lot better." (Laila)

Instead of one flexible duvet many of the informants have several. "I have three duvets, a summer duvet which is quite light, and a thick down comforter, and a year round duvet. It is a little random which is in use, but never the winter duvet in the summer." (Mona) For some different duvets are not enough. "It is off with the duvet or on with the duvet." (Kari) Bedding must, in other words change during the night. Vera says the same. "I sleep well but I wake up early. But I do not think it's the bedding. One can be too hot in oneself but if you fall asleep with two blankets, maybe you need to get rid of one during the night. But if that hasn't happened, perhaps one wakes up because you feel too hot." (Vera)

In addition to different thicknesses of duvets, there are several who choose differently bedding and/or blankets to regulate the temperature. We will get back to this when we discuss respectively bedding and the use of wool in the bed.

3.5.2 The bed is for sleeping

Most say that the bedroom is used to sleep in. Eating, watching TV, etc. takes place elsewhere. However, there are others than the occupants who have access to the bed, "I usually go to bed alone, but then my child comes, and then my cat... and back and forth." (Barbro). Some read a little in the bed and for Kari "the bed is like a cosy place for myself, especially in winter to read in the evening, or Saturday morning." But ideally, the bedroom is not in use during the day. This is challenged by the bedroom easily becoming an extra room for storage and/or activities that would otherwise not take place here.. However, the bedroom is of course not only for sleep. "No, intimate things of course. But it is associated with sleeping. And the kids like to jump on the bed. It is the inside trampoline as they call it." (Mikkel) Both kids in bed and sex we will come back to as we are rapidly approaching the report's core: the bed linens, but first Mikkel says something else important about the bedroom:

"A room that does not get as much love as the other rooms. And perhaps the reason is that it is so private. That it is nevertheless not be part of the 'grand tour'. While it is a room that you spend very much time in. So it's really a bit funny in that respect. And I'm actually a little surprised that there's nothing, a spray or something, against the bed mites. Everyone talks about them. There should be something. Strange that no one has made anything."(Mikkel) He is concerned that the bedroom is private and neglected. And about a small but certainly fixable problem; bed mites, something could certainly be done to solve this. He thinks that this is because this is a room that is over-looked and seldom on display. We will come back to this lack of priority in time.

3.6 Sleepwear and bedding

Clothing and textiles have many functions. We have in the preceding chapter discussed warmth, and this feature is often what most people think of first when it comes to woollen textiles. However, clothes and other textiles also contribute to embellish and decorate. This has been an important function in beds historically (Klepp, Tobiasson & Laitala, Unpublished). Clothing also helps to make the body socially accepted. This includes hiding the parts of the body that religion or tradition dictate are too private or sexual to show off. The textiles also envelope the body and the way they feel, warm, slip or resists will be subject to discussion.

3.6.1 Underwear, nightwear, naked

Nightwear contributes among other things to regulate heat and hide the body. The first is always an aspect while the second becomes important when encountering others. In Miriam's narrative both of these two aspects are present, she sleeps "mostly in nothing - only if I must, I have one extra pyjamas, for holidays where several sleep in the same room. And if I must wear something, it is because it would feel unnatural to sleep naked in the same room as someone else. Not that it's too cold." But if she's cold "it has happened that I have resorted to socks made of wool, it is the first thing I resort to but it is very rare." (Miriam) In other words it is not the same part of the body that is covered for warmth as for decency, nor the same material or situation. Most of our informants are like Miriam, they have little nightwear and use it even rarer. Or as Emma says "only Chanel no. 5". (Emma). Racha sleeps in "everything from nothing to shorts, a big t-shirt. It is nightwear but it is not necessarily clothes that have been sold as sleepwear. But I use it only as that. Some big cotton stuff that is large and soft. These clothes are not used during the day other than at home". (Racha). Sara says the same. She has a pyjamas she thinks, but "stopped using it at one time or another. But own some, actually some pyjamas in a corner in the closet. If I know I'm going on a trip to the mountains and know that it's very cold at night I can find some pyjamas. I guess I have one that is flannel and one that is cotton. But if I'm going on a visit I can bring a singlet that I use as pyjamas so I'm not just ... this is my pyjamas." (Sara).

3.6.2 Life-changes

As we have already seen, sleepwear is something several informants had when they were children, and that they now do not use or rarely use. This change is described by a pair of the male informants. "Yes, when I was very small I slept with pyjamas and I may have stopped when I entered my teens and then I slept for most of the time in a t-shirt and under-pants, and as an adult I found out that it was just fine to sleep naked. If I am visiting someone I sleep in underwear." (Per).

The same change is described by Roy. "When I was very small I had pyjamas. And later when I was a teenager, in my 20s and 30s, I always slept naked. And since we had children, then it felt better to wear something. The children come into the bed, jump and push and stuff ... It feels (correct) to have something on. Although we are in the same family. And although I've made this child, I do not think that it is ok that I run around and expose myself even if they are my own children. But now they are grown, and they sleep in their own beds, now I've stopped using clothes - again." (Roy).

Why did you stop using pyjamas? we ask Ove. "Maybe mom stopped dressing me in pyjamas at some point. And then I got used to it." But why do we dress toddlers in nightwear? "Maybe they kick off the covers more, I would not say that they are more restless, but they have a tendency to kick off the covers more than what I have. And therefore I think it is important to dress them so they survive even if the duvet is at one end of the bed and they are in the other. So at least he has a wool pyjamas." (Ove).

3.6.3 A change in time and setting

"I mostly sleep naked in the summer and I have some clothes on in winter," says Kari. Also for Vanja it is too hot to have something on at night. "I use panties." If she needs something more for the sake of temperature, she wears a t-shirt. When visiting on the other hand, "I have a nightgown that reaches the thigh, with a collar, sleeveless, cotton .. yes and I have a cotton flannel shirt I use if I panic." Or when she is sick. "And I also have some 'cosy' trousers I wear." (Vanja) And Vera says she puts on "long sleeves and pants when it's cold at the cabin. Also in cotton". (Vera) Mia repeats the same. "In my summer cottage, I have one that is long and ugly but comfy, it is very light so if it's a rainy day then maybe you have it on all day and never change." (Mia) These night clothes seem to have in common that they are over-sized, old, ugly, soft and can be used partly at night, if it is particularly cold, but also as home attire. Some of the informants also use nightwear as a norm. Mille is one of them. She has mostly cotton but "just bought one in linen. Woven. I own some flannel shirts as well, but they are too hot." (Mille) Also Vera uses "a cotton nightgown. Either short or cap sleeves". Several say that what they use at night also can be used during the day or actually gets used in the day-time. This can be underwear but also lounge wear of various kinds. "Yes I can comfortably sleep in the same top that I use during the day and the night dress is also a slip that I can use for other things. There is no sharp distinction between night and day. I use what is comfortable." (Kari).

So far, we have not heard much about sleep wear that is used to decorate the body, to feel beautiful, sexy or romantic. It could well be there's more to this than the informants have mentioned. We have one that mentions something prettier. Mia says that "when traveling I might have a silk nightgown. Takes up little space and is nice." This nightie is not only pretty, but also practical, according to Mia because it takes up little space in her luggage.

3.6.4 Sex

When making the interview guide and questions for the online survey, we focused on not making the survey more than necessary personal (due to legal issues). This means that we did not ask, or follow up, issues concerning health and sex life. Nevertheless, in the interviews these issues surfaced.

In terms of sleepwear and both in relation to the absence of sleepwear and choice of sleepwear it is striking that nightwear as a function to make your body attractive to your partner is hardly mentioned. We know from previous studies of clothes that this aspect to a limited extent is high-lighted. It does not mean that sex is generally overlooked in the interviews. The younger informants, and especially those without permanent partners, reply that the need for washing of bedding varies with whether they have a partner or not. One of the middle-aged women says more or less the same. She says that now, when she neither menstruates nor has sex with her partner, the need to wash the bedding and problems to get it clean, are less urgent.

3.6.5 Why we sleep in cotton

Bedlinen is, as we have described in the market research report (Klepp, Tobiasson & Laitala, 2015), very standardized. We will therefore open by discussing why informants follow this standard; why do they sleep in cotton? And the answer is in itself straight forward, "basically because it is the standard". (Kari) Or in other words, we do it because we do it. "Cotton bedlinen is what we've always had." (Sara) This is so obvious that it is not even necessary to know what bedding is made of, "I do not really have much control over exactly what the bedlinen is made of, but also when I am in the store I do not think about what kind of textile the stuff is made of. I assume that it's mostly cotton." (Per) Charlotte has "nightdresses, I think they are cotton also, perhaps some mixed materials". It is not because Per is a man and less interested in clothes, also among women, we find this low interest in what bedding and sleepwear are made of. Charlotte f.ex. does not know what her nightgown is made of. "I'll check when I get home." (Charlotte) She thinks the bedlinen is in cotton "I think it is quite comfortable to sleep in cotton, and it is what you see mostly in stores. And the widest selection. And the prices are good. Silk exists, yes. But I do not think we've bought any, no." (Charlotte).

Another way of saying 'they have it because they have it', is to say that there is not much choice in the market. "There is some variation - but then this is perhaps only (variation in) patterns. I do not think I use cotton because there are things ... yes, it is available in the store and it's a habit." (Mona) "The bed linen

is the same. When you go and buy in the store there's like smooth cotton. And what I'm used to. So, yes." (Sara).

Cotton is therefore easily accessible, a habit, but what is the relationship of the informants to the material? The answer is mixed. "Cotton is a bad fibre, environmentally it is not justifiable to buy cotton, only if it is organically grown, although it has the comfortable properties that it is cool and dry. It is nice. But it is not good really." (Mia).

Another important reason to choose cotton is that the option, at least the option most think of when we ask, is deemed as hopeless. "Synthetics I would not choose for a nightgown or as a sheets or anything. They are available in polyester. I don't get it." (Vera). "Those I use the most are all in cotton. And I have been very conscious that they should be cotton and in any case not synthetic. And if I could choose between wool and synthetic, I would clearly have chosen wool. Synthetic is ... the worst thing that exists. Some sell synthetic bedding for some reason. But there is a fairly tightly woven, not satin or very shiny, but still a bit thick (material)." (Miriam).

There are few who really praise cotton, and several express a dissatisfaction with this in a bed. Iris f. ex. tends to wear a t-shirt when she sleeps away, but "it's more comfy to sleep without clothes for one feels that a t-shirt that is 99% made of cotton can often contribute to it being a little too hot and slightly sweaty. And it is not a material that wicks moisture away but it rather causes you to wake up and be a little like ... " (Iris). Iris has an awareness of not choosing cotton, others have a lukewarm relationship with the fibre. It is also possible that they have become more negative through thinking through the options. When Astrid went through the many different fabric samples to decide which she could not use as bedding, she paused holding a sample in light blue flannel cotton. She wanted to put it away with the others which were 'useless' but then she paused and said, "but it's this material I sleep in!". She laughed at herself and the fact that she had not thought of it before.

The market for bed sheets is dominated by cotton, however there are both different qualities and different fabrics. The interest when it came to bedding among the informants differ to, and also to what degree they had opinions, and words for different qualities. One who thinks that cotton is "absolutely fine" is Eva. She has not thought about that "I wish duvet covers were different." Sheets then? we ask. "Stretch sheets, they are probably also made of cotton" and were chosen because "it is convenient that they stay in place, I like that they are a bit stiff when newly washed so they feel clean. The smooth satin-like stuff, I think is absolutely terrible. Feels clammy." (Eva). Satin is hopeless for "it does not

work - it is slippery and you start to sweat." (Mona) So while Iris thinks cotton is always clammy, it is satin that is clammy according to Eva and Mona, while Cecilia believes that "flannel pills and cotton that is stiff" is uncomfortable". (Cecilia). However, as mentioned earlier informants do not perceive satin as cotton. "There has been a lot like that, you think that satin is better than cotton but we won't use silk, somehow it feels so clammy. But wool f. ex. has never been considered." (Mikkel) Why those materials? "No. I don't have an answer. That's because it was what they had in the store. One thinks that it was certainly more than good enough." (Mikkel). Roy thinks he has cotton "because it is easy to wash and easy to dry, I mangle sheets and duvet covers. And pillowcases. And then they are pretty nice." But he is willing to try something different.

Not all cotton is necessarily easy to keep clean in the eyes of everyone. Laila thinks terry sheets are hopeless. "I have a feeling that they draw skin and dust and become dirty faster because they are so rough on the surface so stuff remains in the fabric. So I am not very happy with the poor quality of the cotton bedding that pills, I throw it away immediately. Those sheets and duvet covers I cannot deal with. And some, where the thread quality is a bit poor, so fibres begin to stick up and then they are not so nice to sleep in as they become slightly prickly, even if they are cotton. That's why I buy the kind that are thin and with a high thread-count, they last." (Laila).

Cotton is easily accessible and "certainly good enough" for some, while others opt out of some qualities and focus on others. Some have also attempted to obtain sheets in other materials such as wool, linen and silk.

3.6.6 Linen, silk and viscose

As we have seen, Iris is not a 'cotton lover'. Earlier her use of cotton "has not been a conscious decision, but was something I bought when I moved away from home and which one just used. And cotton sheets are the ordinary and what is sold," she says as many others. However, she has tried to purchase something else. "I have asked both for wool and linen sheets and it is very difficult to get hold of in Sweden and one almost needs to order especially, but if someone were to say that this was the best possible for sleep, I promise that it would be incredibly popular and would be expensive too. There is a linen mill in Skåne (Sweden) selling linen sheets but they are *very* expensive. And I have a 1.60 m. (wide bed) and that means I would need a lot of sheet, so I had to drop the idea for economic reasons." (Iris) She has thus been in a "bed shop in Gothenburg and asked what kind of alternative materials you have to cotton, have you considered something else, linen or wool or? And they had not and I understood that it was not something that was an option since there was no

demand. It was *Hemtex* here in Gothenburg who did not know. That's a pretty big chain so they sell volume, what the consumer demands." (Iris)

Iris has therefore not reached her goal through the market, we shall later see how she solves this. However, we have informants with bedlinen in other materials than cotton. Barbro has "cotton – but sometimes linen. And then I have a bamboo bed sheet as well. " Here she is probably confused by the marketing and the bedsheet she refers to is not in bamboo, but viscose. "Pillowcase and duvet cover, they are cotton and linen." Barbro thinks "cotton is cold. When one is used to wool, it feels very cold with cotton". Most of Mille's sheets "are in cotton but I have something in linen. I try to switch to linen." (Mille) And Agnes "has duvet covers in linen or cotton. I have sheets, pillow covers and duvet covers in linen. I really like linen. Actually, you'd need a mangle for when you have washed linen to bring back the shine that the mangle provides. Ironing does not do the same. But I hang-dry them and then they turn out nice anyway. I think it's best to sleep with a linen duvet cover. It regulates the warmth very well." (Agnes) "I have been considering for a while buying a cover in silk. Silk fabric. (...) Linen, raw linen is out there and I want to try it." (Roy) Mia thinks that "if I could have afforded it, or rather if there were better sheets, I would like to have them in wool (...) And at my boyfriend's when he has washed and mangled his linen sheets, it is so wonderful and comfy to lie in ". (Mia)

While several of the Swedes slept in linen, and even more want to try, only one of the Norwegians mentions linen. "Maybe something in linen, which has a bit the same feeling that it transports or is airy, wicks moisture away. I would like to have tested it some more. As I have only experience with cotton. I have never tried linen, I would like to have tried it out. And wool if it existed." (Kari)

It is striking that linen is not mentioned by more of the Norwegian informants. One explanation may be that linen production has been more prevalent in Sweden than in Norway and that more linen is marketed there. Later we shall see that there is a difference between Norwegian and Swedish informants when it comes to how they judge the linen sample in the material test.

3.6.7 Taste and priorities

For many informants, bedlinen is something they have not thought a lot about and that they do not think is particularly important. They do not care so much about how it looks. About the bedding's appearance Vanja says: "I'm not too concerned." (Vanja) "I do not have a lot of opinions obviously; it is most important that it is soft." (Ove). "What colour bedsheets have is not so important for me, but if I had to choose something myself, then I would choose some

bright tones." (Per). Tony explains, "as long as they look all right, then. I even have one that is blue with some like gold stuff. I do not think so much about it. I'm not the one who has to match the wallpaper."

Nor is it necessarily the case that an interest in textiles from other fields leads to a greater interest in bedding. Vanja is very concerned with textiles both privately and through spinning and weaving, though she is rather lukewarm to the whole issue. "When it is so worn that you can run your hand through it and it is washed to pieces ... then we will probably agree that it is time to buy something new and then we'll see who has the time to do it. (...) If I had cared, I would certainly have been the one who had decided." (Vanja) She is one of several who brought bedlinen with her when they left her childhood home and some of this is still in use. "As the oldest is 20 years old and then some. I use them until they go to pieces and I use them to test patterns when I sew." (Vanja) The long life is both an expression of that she is not very engaged in the questions surrounding bedlinen, but also that she is concerned about textiles' environmental foot-print.

For others bedlinens are important. Laila says "I've always been very finicky with what I have in the bed. So I've invested in the bed." (Laila) Kari can also recognize the desire for something new, even though it is not necessarily expensive. "I wanted something new (at the farm) because it was newly refurbished. It had to do with colour and design, a bit like a 'styling need'. Not just anybody gets to sleep in what I've thought through for a guest or child." But everything is not new for that reason. "I guess I have sheets on the farm which are probably from the 1830s, my grandmother's sheets and pillowcases are just very nice. So I think it's just as nice to sleep in them as in the new." (Kari)

What is 'old' is relative. Tina says that the bedding is used only a few years. She buys cheap and sometimes "just super cheap - NOK 200, I alternate a bit because I tend to have one that is a bit nicer and more expensive - which is bought on sale. And then the original price could be up to NOK 800 per set. As I do not feel I get them completely clean, I switch my bedsheets quite often and then I throw them away and therefore I buy cheap. I cannot have them more than 2 years, after that it becomes just disgusting. The oldest in use is 2 years and I have to throw it out soon." (Tina). "Maximum life is 3 years, then it has lost both shape and colour and buttons and ... " (Mona). Charlotte says: "We certainly have some that are old. We change them all the time. Yes, what should I say ... we certainly have sheets that are 6-10 years. Maybe we do not use them as often." (Charlotte).

We see that the priorities are different, and what is considered 'old' is very variable. Some have sheets from the 1800s. While others think two years is the maximum. In between there is an ocean of differences. We return to price in due time.

3.6.8 Colours, patterns and structure

Many prefer things light and simple. "I use mostly white, light, the wellbeing feeling. (...) Lighter, natural colours yes." (Kari) "White white white." (Mille) Astrid want things that "look fresh. I choose colours that are calm, white, grey, not colourful things, a little peaceful." (Astrid) While Kari's white is primarily related to a style she wants, the absence of chemicals in the colour process is important for Mille. However, all obviously do not want the same. Vera found that "white is slightly greyish after having washed so I try to avoid white. Rather a different colour than white for my part." (Vera) "Neutral colours on the duvet cover. Do not think it is alright with screaming stuff when one wants to rest." (Mona) Here we see that not only taste but also the rationale for the taste varies and that the appearance is only one of several possible reasons for selecting, or justifying, choices.

Beside white, soft, natural colours are mentioned. Agnes says: "My kids call our bed for the hotel-bed so I want one colour. (Laughter.) White or grey or brown. Yes. Boring. Restful. And timeless above all." (Agnes) But someone will naturally also want other things. "I really like that the colour is completely solid and as plain as possible. Preferably dark colours." (Eva) Vera has "purple and green and all possible colours. Bright, as the duvet cover has a pattern."

Not everyone wants things plain and in a solid colour. "It is very easy to answer because I am a girl. I think it's very nice with brocade. Bling. My favourite sheets are brocade, white and black. In cotton and they are ripe for replacement. (Laughter.) They have been washed so many times as they are completely worn out. Perhaps I don't really have a dream material for bedding, I've maybe not thought carefully about this. Pink flowers, however, will not happen." (Mona) "Otherwise, I like a little fresh west coast blue-and-white-striped. A little summer-like." (Miranda) "I think it's very nice when it's like a strong colour. Not sugar sweet flowers but more a cool pattern, more like something graphic " (Sara)

Mikkel and his wife have "bought this and that. Some of it has just been completely white. While some have been a bit more ... We were very partial to graphic prints for a while. And that it had to be a statement. And so there have

been some that I purchased, which were a good deal. They were never used as it was a total mismatch with the design profile at home". (Mikkel).

3.6.9 Shape

We have not asked about the shape of the bed linen, but two of our informants spoke about this anyway. "I think that it should be designed differently so it was easier to make the beds," says Mille, who is not necessarily one who accepts the offerings on the market as the best solutions. Laila has experience from living both in Norway and Sweden and says, "That big difference between Swedish and Norwegian bedlinen is how you get the duvet into the duvet cover. In Sweden we have the two holes on top. And it's very smart, you cram the duvet in and then pull it through. And then recently they have started with buttons at the bottom and I think that's very good. For a lot of times the Finnish and Swedish (duvets) they tend to slide out somehow. But the Norwegian covers have the opening on the side. And no holes. It is more problematic to get the Norwegian covers on the duvets, but they often stay in place longer when they finally are on. But the Swedish and Finnish ones with holes and with buttons at the bottom, they are very good." (Laila).

Racha is warm. And says that her dream bedding is "cool bedding so it does feel a little cold and not warmer than my body temperature. It should not warm me up, not be hotter than what feels neutral for me." (Racha) But this raises the question, what kind of bedding is it? Mikkel's dream bed is "Clean, smooth. Fragrant". And this is a desire that cannot be fulfilled through the design of the bedlinen, but through caring for it.

3.6.10 Laundering the bedding

We have some knowledge about what the Norwegian population responds when asked about how often they wash bedlinens (Laitala, Klepp & Boks, 2012). But we also know that things you do rarely, is more difficult to know exactly how often one does, and that many also want to wash more often than they do. The bedroom is, as we have mentioned, not highly prioritized, and this also applies to changing the bedlinen. This does not hurt others, only one's own well-being (Klepp, 2003). But what do the informants say about bedding and laundering? We know from the discussion of lingerie and underwear that cleaning is considered a possible problem so we need to know more before we discuss how they envisage that the wool-bed is to be laundered.

Also among our informants, it is clear that they do not always wash as often as they think they should. "Maybe once a month. Ever so often, to say it like it is,"

said Eva, adding that she launders a 60 degrees, and does not tend to air the bedding.

Kari is the person who washed their wool least frequently, but generally has a high laundering frequency. Few others change the bedding as frequently as she does, "I launder once a week, and air duvets etc. when it is cold," says Kari. That is 4-8 more often than Per. "Launder once a month, or perhaps every other month, no airing. Wash at 50-60 degrees, I cannot remember the temperature. Something like that," (Per). In other words, not a fixed standard, although the bedding in many ways is very similar.

Mona is more like Kari. "Bedlinen is (washed) at 60 degrees. I use it just over a week and then I wash it at 60 degrees. Yes. I actually dry-clean one duvet. For how do you get it dry again? I have no dryer? Air? Yes, sometimes, but it depends on when you have time and not during the winter time. It is more like just airing - not letting them hang out of the window for a very long time. Everything depends on how cold the winter is." (Mona) The custom of hanging out bedding in freezing weather was practiced by more when the cold was used to remove vermin in sheep skin-bedding. Today, it is more bed mites that are removed through this treatment.

3.7 Experiences sleeping in wool

In this chapter we will look at what kind of experiences informants have sleeping in wool. In the next chapter we will discuss how they think it will be sleeping in wool, i.e. what kind of expectations or beliefs wool bedding and nightwear raise. Based on our research of the market that showed very little nightwear and even less bedding in wool (Klepp, Tobiasson & Laitala, 2015), we were initially very surprised that so many informants have experience of sleeping in wool. Most of the products we will discuss here are used in ways other than they were intended to be used. We will once again start with what is closest to the skin, nightwear, which is generally underwear, and work through the layers of cloth until we reach the wool filling in duvets. The actual experiences of using the products from the market are collected at the end.

3.7.1 Nightwear

We have previously seen that many informants do not use nightwear, because they do not like to wear clothes at night and because they are too warm. Part of the use of nightwear is for the sake of modesty, but there is little talk about other possible functions sleepwear has. This indicates that when the clothes are worn

at night it is often just for warmth. Or, as Roy says "either wool or nothing. The times I have felt that I must have a long-sleeved top, then it has been wool." (Roy) Thus, wool is the natural choice for night.

Astrid sleeps in wool underwear as we have already mentioned. She is not alone. For some nightwear in wool is addictive: "Having slept in wool the last years, I do not want to wear cotton, so they remain in the closet. They become sticky when I sweat at night, and just bunch up." (Kari) Other sleep in wool occasionally. And especially when it's cold or they feel they need a little extra warmth. "Habitually I wear only wool; socks, long johns, and preferably a t-shirt when I feel a bit like under the weather, since I get cold." (Lise) "Sometimes when it's cold" Cecilia sleeps "in long-johns". "It happens that I sleep with a wool singlet," says Eva. It therefore seems that we have a pattern. Some sleep with woollens as sleepwear all winter, others on special occasions, something we will now take a closer look at.

3.7.2 At the cabin

We have previously seen that the use of underwear is different at the cabin, where both adults and children can 'loungue around' in wool underwear all day. Also at night wool underwear is popular at the cottage. We will first hear what Laila has to tell.

"I use more wool (at the cabin) because we're out hiking and skiing. And yes there I actually slept in long-johns and long sleeved tops despite the fact that I do not at home. When you've been outdoors and been really warm the whole day, you will be colder at night. So that is why I tend to sleep in wool underwear there. So I have a set just to sleep in, with me. And then I have 'out-door' clothes and it's wool throughout the day. Wool, wool." (Laila) There are several reasons that wool is preferred. "It is a little colder throughout the cabin. In winter, we heat it up and it becomes quite toasty. But we walk around in wool-longs. (Laughter.) And we are perhaps not very fashionable. But it's just the family so it doesn't matter. So you get the picture of the whole family; cousins and grandmothers and everyone walks around in woollen long-johns and woollen tops and are outdoors all day." The description is good, and we see it clearly. However, the expression 'unfashionable' is not entirely appropriate. We think she uses the word because it is a well-known expression, not because she believes it has anything to do with fashion, but rather with the relationship between clothing and the occasion.

This simplified practice deviates markedly from a central clothing norm; underwear, especially underwear on the lower body, is not enough to dress a body

in the company with others. They are, in other words not dressed. Despite the obvious difference in using underwear as clothing during the day and using another fibre than normal at night, Laila has not reflected over this, "I had not thought of this unless you had asked about it in that way. But one acts a little differently at the cabin than you do at home." (Laila) Another interpretation is that the choice of clothing is something that is not reflected much on, and if done, it is with the terms and concepts that are strong in marketing of clothing, such as fashion.

Several of the others tell of more use of wool at night, at the cabin. "Now and then I can sleep in a type of underwear, wool underwear. But maybe when I'm at the summer cabin when it is cold or not every day at home so much (...) It is a little cooler there so I use wool pyjamas. It is underwear. Only *Nøstebarn* has a (nightgown) and they are really expensive." (Barbara). And although they do not necessarily sleep in wool often, it is for many an experience they remember. "Yes I have done it (slept in wool) at a cabin when I was younger. We slept in the sports clothes we had. There was ice on the windows when we woke up. But that was very many years ago. Long-sleeved woollen things and long-johns. And when I was in the scouts and when we slept out-doors, I also used wool." (Tina).

We previously heard that wool socks are considered a warming garment before sleepwear. This may also apply at cabins. Socks? Sara says that she uses wool socks at the cabin. "I forgot to say that. The season has not begun yet, but I obviously do (use socks)." (Sara). Again we see that they do not quite remember what they do before we ask several times.

More wool is used at cabins both during the day and at night than at home. The informants explain this by saying that it's colder there. It is of course quite possible, but another possibility is that the dress codes are less strict and therefore it is more of a 'free for all' what one dresses. That wool underwear is part of the wardrobe anyway because of the outdoor activities that are a strong part of cabin life (Vittersø 2012) can contribute as well. In addition, many cabins are designed in a style with natural materials. There is more wood and stone, than wallpaper and plastic, and more use of national and traditional styles. The very idea of the cabin and use of wool can thus have more in common than what has emerged in the interviews.

3.7.3 Toddlers and being 'under the weather'

Earlier we heard about Norwegian babies dressed in wool. Also among toddlers more woollens are worn at night than among adults. This also fits with that the

market for sleepwear in wool is far greater for children than for adults (Klepp, Tobiasson, & Laitala, 2015). Eva's children have "tended to use wool pyjamas". (Eva). But now this only applies to the 'youngest' who "uses wool pyjamas in winter. But the oldest refused, he will only wear underpants when he sleeps." She herself sleeps in "sport jersey and wool long-johns and use it as pyjamas". (Eva).

Several say that they sleep in wool underwear when they are sick. "Then I certainly dress myself in wool! It's like having a teddy bear." (Kari) "Sleeping in wool underwear is something I do if I'm sick. When you have a fever and stuff and freeze and freeze and freeze. But I sleep in wool socks, long-johns and a wool top." (Ove).

3.7.4 Blankets

We have seen before that the temperature in the bedroom often follows the outdoor temperature, as Agnes says "we sleep with the window open year round. I like to have a cold bedroom and that is no problem. I think it works very well. In the bedroom I always have the outside temperature. If it is zero outdoors then it is zero inside (laughter), so then you just have to creep under the covers." (Agnes) This means that the requirements for insulation varies. And Agnes solved this with a wool blanket. "I have a wool blanket. I use it during winter. And in the summer when I only use the duvet cover (and no duvet inside), I have it in addition in case it's cold and then over the duvet cover. Just on top, so it is easy to remove if it gets too warm." (Agnes). Or as Kari puts it, a blanket is "like cosy and regulates the temperature." (Kari).

Mia always "has an old wool blanket in bed. I have a cover and then I have the blanket, I would not be without it. I think it's so nice with the weight. I want the compactness around me." (Mia) At Laila's there is a summer and winter duvet, but the husband also uses blankets on top of the duvet in a transitional phase. "That way he postpones the transition to winter duvet a bit." (Laila). While she likes better warmth and can therefore start with the winter duvet earlier in the autumn. Lise says that the blanket is there more for security. "In winter I have a blanket, which is only there in case I get icy. Pulling the wool blanket up and over the covers to the mid-stomach." (Lise).

Kari's blanket is there year round. "I have grown up with it. Hand-woven and several meters long, so it can double up, an old 'trønder' (the area) blanket, bright pink with some flowers. It is very long, and can lie across the bed. I do not pull it up. When it's cold f. ex. in Trøndelag (where she has a farm as a vacation home) I can have it under the covers, lying on top of it as well, having

it over me and then over the covers as well." (Kari) When she was a child the blanket was used in this way under the covers, both over and under the body.

So far we have seen the use of blankets to provide extra warmth, in addition to the usual bedding. But several informants also tell about other ways blankets are used in the bed. "What I have done is to sleep with a blanket as a duvet with a duvet cover on the outside. I did that for a period when I did not have a thin enough down comforter. A little bit like a nice cool duvet." (Astrid). Here we also see that the blanket is used to get a cooler bed and not a warmer one.

Emma does the same "in the summer, I take a thin blanket and put a duvet cover around it. It is thinner than the thick duvet. And it can be washed. During the winter I have a regular comforter with a duvet cover and then over that a blanket. If it is cold. I am very warm at night but when you go to bed, it is nice to have something warm," says Emma, adding, "I ought to have my own winter duvet. But given that I vary with the blanket it works out fine". (Emma). It therefore seems as if wool blankets are both used for a warmer and colder bed, and it can also be used if one lacks a thin duvet.

Iris has "lots of blankets" and "they are easy to care for. So I use them and sheets. A little old-fashioned. Instead of a duvet, you have a kind of thick wool blanket." Underneath she also has a sheet in cotton. But "if it's really cold", she has both a blanket and a duvet. "The blanket is a really thick blanket. An old horse blanket. It has been around for quite some years, since my mum was a child. It is slightly felted, it is woven and thick. (...) In the summer, I do not have a duvet at all. Just a cotton sheet, since I'm pretty warm. The blanket I do not think I've washed. I just hang it out a bit and beat it." Iris thinks "the duvet gets a bit sweaty and even the sheet too. Especially at that time of year when it starts to get a little cold and then it is hard to find" something else. (Iris)

Irene could not agree more and has taken another step away from the cotton and let blankets replace several bed textiles. She has stopped using a duvet and sleeps only under a blanket. Before she could be both too hot and too cold at night but "not now when I have wool. (..) Now I manage with the blanket and I feel the temperature is more even". (Irene) Under her she has "unfortunately cotton sheets since I have not found anything else. So I have a blanket only, and when it gets colder I take another blanket and sleep on top of it. But the ultimate is to have a wool sheet instead of cotton. I want to get away from cotton. Then it would be optimal." She has also adapted the bedding for "the little kids and made up the beds with blankets. I have a blanket that I have as a pee-cover, and then I have a blanket on top of that". (Irene) The textiles in the toddlers' beds have in common that they are not made for that purpose, but consist of various

blankets that are partly older and felted together. She has cut off the fringes and thus made them more suitable. Ready-made wool bedding on the market, she has "not found" and does not think it's possible to find "not in Sweden at any rate".

Irene slept in wool for about 2 years. "But I have felt for a long time that I should get away from cotton and have been looking (for an alternative). I've known that I've been wanting to get away from waking up sweaty and cold and wet in the morning. What I have found is really expensive." (Irene)

3.7.5 Cabins, guests and on the couch

At the cabins it is rather usual to use blankets in combination with other bed linens. Common for many cabins is that they are cold when not in use. "The first night I sleep in wool as the house is cold. Then it is nice to sleep in wool underwear and a wool blanket. There it was more natural because the house is freezing. It's a habit that I have taken home with me to where I live." (Kari) "At our country-home we have a blanket that always lies in the bed. It is on top of and covers the bed." (Roy) Iris says that at the cabin she uses "all the wool garments I have. And we carry with us the blankets and stuff. When we're on a camping trip, we have with us huge blanket that we have under us. As isolation underneath for the ground".

Blankets also serve as a temporary solution whether you're talking about unexpected guest who sleep on the couch or if the normal bedding is not available, or for more random sleeping arrangements and sleeping places. Did you ever sleep with a blanket we asked and they answered: "Sometimes I have used a blanket instead, a wool blanket. Woven in wool... when I washed my regular duvet." (Vanja). "I've slept on a sofa at other people's places with a wool blanket, but then I had clothes on as well. Others have, with my wool blanket as well. I have fleece blankets, but a wool blanket is the best." (Tony) "I think I slept on my grandmother's the couch under the good wool blanket, but with my clothes on, simply taking a nap. I do not know whether it is the food or the wool, but I sleep very well. (Laughter)" (Mona)

3.7.6 Change

Is the custom with blankets an older form of bedding that has survived until today? It is not so easy to tell, however more informants mentioned that this is something they have brought with them from their childhood. We have already heard Kari using this reasoning. And it is both the blankets themselves and the practice of using them in the bed she was referring to. Sara says the same thing.

"When I was younger and lived at home we had wool blankets over the beds. But now I put on a pair of socks and I feel it is enough. The wool blankets were meant to have over the feet. So now I have socks on me instead of finding a wool blanket." (Sara).

Vera has used blankets inside the duvet cover summer and winter, but in summer "just one blanket inside the duvet cover. My previous husband's grandmother, she worked at a woollen mill which was located in Habo (Sweden) and they made blankets. So when we visited his parents' home we had blankets instead of a duvet for she had plenty of old blankets that she had bought and then I discovered that it was enough having a blanket ... not a thick duvet, you became warm anyway." (Vera)

We have previously written about the history of bed textiles in Norway (Klepp, Tobiasson & Laitala, unpublished). And the use of blankets in beds probably increased rapidly due to the early textile industry that made precisely such fabrics cheap and readily available.

3.7.7 Wool filling and mattress

We have been more concerned with the next-to-skin bed fabrics than with use of wool as a filling for mattresses or duvets. Yet some of the informants have told us about this use of wool. "I sleep very well especially after I started with a wool mattress, the big one. Absolutely a huge difference. I might have done it for 10 years. Before it took a long time before I fell asleep ... it took longer than it does now. Because I needed to warm up the bed for so long." (Barbro) This "bed mattress has one side in wool and the other in cotton so one is supposed to use one side in winter and other in summer - the bed mattress. I am quite frozen." (Barbro) Her "duvet is (filled with) wool and the pillows a bit mixed. I have a wool pillow and down pillow. But wool sheets, do they exist?" she wonders, and that's a good question.

3.7.8 Wool bed on the market

As described in the report (Klepp, Tobiasson, & Laitala, 2015) the market for wool bedding is very limited. There are wool-filled duvets and pillows, and bed sets that are a mix between blankets and sheets and blankets and duvets. Not all informants have heard about such products. Astrid knows that there are duvets with wool filling: "I've heard about this, but I have not touched any. I associate it more with like old-fashioned quilts that are very heavy." (Astrid)

Some of the informants have a certain experience with wool from the market. Astrid's mother has bedding in wool. "They are purchased in Spain and it's totally wool and I think she felt that it was a bit over the top. Slightly thick and hard to handle, the duvet was a bit stiff and the pillow a little thick but I think she sleeps on top of the sheet."

Racha's parents have the same type of bedding. As immigrants from a warmer climate, it may be that they appreciate more warmth. Racha sometimes sleeps in their parents' bed. "When I'm at home and if one of them is gone. But it is like wool, everything is wool. it is not a duvet, it is more a blanket. And sheets too. It's very strange. And it is okay to lie on top of the blanket, I mean the sheet which is wool, but I like duvets a bit fluffy, as I tangle myself into them, and cradle them and cram them together. But the blanket feels a little less flexible. It is just on top. So I have found that I do not like it. So if I am sleeping in my parents' bed because they are gone, I now always bring my own duvet." But what about the warmth, is it a problem, Racha's a very hot-blooded young lady. "No, not the warmth, just the shape," says Racha.

We have one more story about this type of wool bedding. Sandra recalls: "My dad tells the story and he has not told it just once. He has told it several times. That those (who have this type of bed) are so strange, who have wool sheets. Almost like they are a little disgusting. How can they do it? Wool cannot be washed, so ... and it is the only time I ever heard that someone has talked about someone who sleeps in wool sheets." (Sandra).

The stories we have here from the use of the products available on the market fits well with what we found through searching on-line. What is available is very far from the products that people are used to and are experienced primarily as very 'alternative'.

3.8 How could a wool bed be

So far, the report has referred to experiences the informants have, but how is it to imagine anything else? How would it be to sleep in a bed where sheets are in wool or sleepwear is wool, when you have not tried it?

"I have become very curious about your product," said Agnes and was certainly not alone. Almost everyone we spoke to expressed a desire to try both sleepwear and bedding and would like to participate in the next step of the survey. It is possible that this wish contributed to a more positive attitude than we might otherwise expect. Another factor that can point in the same direction is a desire

to be polite and positive to what we were obviously engaged in. Here are some of their expressed views reflecting this positive curiosity.

"I would probably love it. If it is soft of course. Is it possible to make wool flannel? (Barbro)

"I would like to actually use wool, as I know that I like to wear wool next to skin" (Kari)

But why do they think wool linen will be good for them? Lise thinks wool bedding would be the thing for her because "I give off a lot of warmth, I tend to be cold and it is a bit problematic in relation to the bed and bedding because I am often so cold, or I am totally drenched because I'm so sweaty". She often finds that she gets too hot and cold. "This has been a good night, without sweating or freezing, but most of the time it's troublesome. I think that many of the good properties (of wool) are good for such a cold and sweaty person like me." (Lise) Iris believes that "the wool both cools and warms at the same time. The body always emits a little moisture and I think it could have a cooling effect to have next to the skin in that it does not become sweaty and you don't notice the moisture in the same way in that wool can absorb 30% of its own weight in water without getting cold, so it is amazing". (Iris)

"I think it would be exciting to try. Very. With the experience I have with woolen clothes I would hope or expect it to have the same comfort-feeling through that the temperature is well regulated and that if I freeze or sweat it will even out automatically. In addition to the wonderful, heavenly feeling against the skin, that comfort. (Some laughter.) Simply." (Kari)

Obviously our proposal met the most enthusiasm from the dedicated wool users whom we have met in this report. More surprisingly, are the reactions among those who use wool more seldom. Even Per, who does not own as much as a woollen sock, is far from dismissive when we ask, How would it be to sleep in wool? Admittedly his first reaction is silence ... "Good question. If I had felt like these clothes (underwear from *Aclima*), it would go smoothly, but I think it would be more troublesome if I had worn this as clothing. I do not think I would encounter any difficulty with it (as bedding)." (Per) The same applies to Cissi who, although she does not use wool, she is not particularly wary of the wool linen: "Spontaneously one thinks prickly. (Laughter.) But when you feel this, one thinks soft and it breathes." (Cissi)

Both Per and Cissi have little experience with next-to-skin merino. And they both use *Aclima*'s wool underwear that we showed in the interview as a reference when they try to imagine a wool bedlinen. Many of informants are far less familiar with woven, thin merino, than knitted. But many also have an awareness of this difference. They perceive the knitted wool samples as very stretchy and imagine that this is due to spandex and not the knit. But obviously not all. Agnes asks if the wool linen in question is "woven or knitted? I feel that a duvet cover should be woven. I've seen duvet covers in cotton jersey and it does not feel interesting." (Agnes) The relationship between woven and knitted we will return to in the material test.

3.8.1 Warmth

Not surprisingly, given the discussion about wool initially, is that warmth is a big topic when informants envision how it would be to sleep in wool. Which goes both ways. Cecilia thinks bed sets in wool would be better because it will be warmer. Cecilia and her partner are very different when it comes to temperature preferences. "I have the thickest duvet, I freeze easily and would have liked an oven in the room. But it's set to 16 degrees and is only there to prevent moisture. I have an electric blanket during winter; while he wants it cold. I turn it on before I go to bed." Wool bed linen can solve one problem: That she freezes. "Spontaneously, I would say that it would not be as comfortable. (...) The fabric you showed before was more tempting (*Aclima* underwear). I like to be warm. So if it was nice I could imagine it, and have a thinner duvet instead." (Cecilia).

For others however, the problem is that they envisage that the wool bedlinen will be too hot. "Although I'm fond of wool, I think it is really nice that when you go to bed and the (bed) is cold. (Laughter). I think it's wonderful. And slowly but surely it warms up. (Sara) Racha does not know. "I am afraid to get too hot, but I know that wool can be cool too. Or ... I associate wool with something that will keep you warm, but I've heard rumours that it is not the only use, but in my head it's that." (Racha) In other words, perhaps the primary problem is in relation to "the idea of wool" more than the reality of wool. We have met this ambivalence repeatedly. They have heard but cannot really believe it, when it comes to a number of characteristics of wool. Even Eva has difficulty in believing completely what she's heard. It is difficult for her to envision wool bedding. And "it depends, wool can be very different things." A major problem is that she gets "very, very warm at night, but wool is supposed to be temperature regulating, but it's warmer. But maybe it's less disgusting when you sweat a lot, that it's wool." (Eva) Again we face the uncertainty with respect to whether the properties they have heard about actually will make a difference in practice.

And then the question is obviously what kind of wool. Not wool as in "traditional wool socks" but "in relation to what you have shown me from *Aclima*, that seems very comfortable. So if I consider the samples that are actually here, I could get a good night's sleep. What I might be sceptical to when I think of sleeping in wool, is perhaps that it may be too warm when one is accustomed to cotton that does not emit as much heat. But testing is a way to find out." (Mona). This uncertainty that several voice can easily be countered through trying and seeing for oneself.

3.8.2 Better than something else

One possible reason to want wool bedlinen is that one is not particularly happy with the bedlinen one has. Tina is among those who uses wool underwear very rarely and does not own a woollen sweater nor any clothing in wool. She is hotter than everyone she knows, yet she's positive to try the wool night-clothes: "If it is very thin and soft and a nice material, I think it would feel quite good. Because it breathes and wicks moisture much better. I think it really would work very well. As long as it is like that, huh. Nothing like the thick stuff. Once you put me onto the idea, I became excited about it." (Tina) One of the reasons for this is that she is not so happy with her cotton bedding as we've heard before. "Cotton bedding is a bit too dense. Although I wash and wash and wash, I do not feel I get it completely clean. And I cannot wash it at 90 degrees, for then it shrinks. So something more breathable would probably work. Since I never freeze, I'm pretty warm, and certainly not getting any colder as the years go by. (Laughter). So they are ... it draws in moisture and stuff that come out of the skin that I do not get out when I wash. So if it breathes more perhaps that nasty stuff does not attach itself." (Tina) She wants thus a more breathable bedlinen, one that is not so dense. Whether informants believe it will be easier or harder to keep clean, will be discussed shortly.

Sara thinks that wool sheets would be very good for toddlers. "The oldest he wets the bed during the night. And as he does not tell me immediately, I think it is much better to pee in wool for it will not be as cold as cotton (...) The smallest one could benefit. For he kicks off the covers and then he complains that he cannot get (the covers) over himself, and I think it would be warm to lie on the wool as well." (Sara).

3.8.3 Problematic

The biggest problem for most is to actually visualize the products. However, "one can easily see it as a wool blanket with only a duvet inside." (Cecilia) But the properties? "That (underwear) doesn't itch. But I cannot imagine what it would be. I cannot visualize it, how the consistency could be, especially sheets." (Cecilia) The possible problem she thinks about is itching. But as Mikkel says, "The underwear doesn't itch." (Mikkel).

Roy however, thinks that it may be "really comfortable and nice! But I think that taking care of it becomes more difficult. But that's just what I think since I've got no (experience)". (Roy) Kari thinks of wear and tear. "It has to be a nice thin merino wool so it will wear after a while, and then will need to be repaired and .. the durability issue. I'd be concerned about this. Then I also thought that I would have to change the bed less often, and that would be fantastic. Because it's a job. Less washing and trouble with it." (Kari) So opposed to Roy she thinks it will be easier to keep clean.

Some see mostly problems. For Vanja it does not "feel normal. It could be it breathes better. And since I do not like to be hot, and it breathes and wicks away sweat better and stuff, it's possible it's better." (Vanja) But she is also afraid she would "come to react purely allergic or with eczema. It probably depends on the season." She does not see benefits "except that perhaps it's warmer". (Vera) Another disadvantage is animal welfare. "This mulesing that one wonders about and how it is produced and stuff." (Vera).

What could be difficult? "Maybe the shape?" suggests Ove, "because cotton holds the same ... you have a square shape of a cotton fabric and it remains easily in that shape and I think that wool is more malleable and is more flexible as a fabric so the shape may not hold as well." (Ove) And Sara agrees. "Is a wool duvet stable enough? Would it behave like a cotton duvet cover, when it is completely washed out, completely like soft and slouchy? Then I feel like the duvet squirms inside and that duvet cover loses the hold on the duvet. Something like this I feel might happen with wool as well. But there is probably a way to solve it." (Sara).

3.8.4 Wool nightwear

Generally, the informants are less curious about nightwear than wool bedding. And as many are not sleeping with nightwear at all, the change to wool is about more than going from one fibre to another. "It might be a bit of a big step to go for this as it is not something I normally use." (Mona). "I'd probably rather have

slept in wool duvet covers than in wool clothing. But it might be I'd change my mind if I tried. I think that it is more difficult to regulate if one gets too hot. It is easier to pull off a blanket than to take off your clothes." (Agnes).

However, they also see advantages and several have more experience sleeping in underwear than with sleeping in wool bedlinen. "I sleep in wool tights, so why not? I'm thinking flannels, in wool, roomy, a little more lounge-wearish." (Cecilia) Underwear in wool, "it would have been nice if it was neither long sleeved nor long-legged. I get a little clammy sometimes in cotton, so I'd like to sleep in wool". (Racha) And Barbro would rather have something in "wool and silk". (Barbro).

Wool nightwear could be nightwear as we recognize it in other fibres f. ex py-jamas in woven fabrics and with a loose fit. However, there is also the question if wool nightwear is something separate rather than something flexible (with other uses). Many have already taken their wool underwear in use as sleepwear and there is no mention of this being unpleasant because of the tightness of the clothing or the form. The same applies to cotton where large t-shirts and boxers are more common among our informants than clothes marketed as sleepwear.

3.8.5 Cleanliness

We have previously discussed the problems around laundering wool panties. Here the problem is based on that laundering panties follows a very specific norm. They have to be cleaned a single day us, and washed vigorously (Klepp, 2006). Meanwhile wool's advantage is that it needs less laundering, but the drawback is still that it does not withstand the same harsh washing. This dilemma led to many informants being unable to envision panties in wool. One advantage of bed linen is perhaps that standards of cleaning frequency are not so strict? We have already shown that the difference between informants varies, along with the differences between the individual's ideals and practices.

Kari was the one who washed wool underwear least frequently and bedding most often (every week). But what then with wool bedlinen? "Hmm ... I don't know. Well, once a month perhaps. But yes, it had to be tried out. Difficult to answer. Less than I do today. As I have white bedlinen, it looks a bit dirty from body oil and you wash it because it looks dirty. I think it would be different with wool because it does not have the same super-white colour to begin with". (Kari) Agnes is on the same page. "Maybe not as often as a cotton duvet cover." Eva agrees. "Maybe it will be less disgusting between washes, maybe it stays fresher longer. I wash my wool singlets rarer. I can go for two months (without laundering)."

How would you launder it? we ask Eva. "Surely using the wool program, but I would look at the label." She has "nothing against that it could not be washed at 60". (Eva). Vanja thinks that less frequent laundering requires more airing. "It's difficult when you live in a city to air, if we had lived one floor up it would have been easier. I'd like to wash it less frequently if it was easier to air." (Vanja). Here we see that the older methods of keeping bedlinens clean – airing - is not so easy to achieve because of living conditions. This again affects how often some think they will launder. Another possible problem is that they do not own tumble dryers. Therefore, it becomes more difficult "to dry. As the bedlinen should preferably dry at a normal room temperature". (Barbro).

One who has less experience with next to skin wool, but also has less confidence when it comes to the wool laundry cycle in the available washing machines, is Vera. Wool bedding for her has no advantages in terms of laundering "for I sincerely want to wash my bedding at a higher temperature. I have trouble seeing the benefits (of wool)". (Vera). Mona agrees. There is a clear idea that there is a direct correlation between washing temperature and cleanliness. This perception is independent of the fibre. "There is a crash, for bedlinens, I launder at 60 degrees with *Omo* (a Norwegian detergent) normally. Wool I tend to wash at 30 with *Milo* (a Norwegian wool detergent). I am unsure. I don't want to wash it at a low temperature. But heat and wool, one thinks that the fibres are actually ruined if you wash it at a high temperature." (Mona). Laila would also "like to be able to wash bedding at 60, because that's what I launder other bedding at. But I don't with panties, as they are changed so frequently it doesn't matter. With bedlinens I tend to assess how dirty they are, as when I wash clothes (and textiles). With wool I often feel that it is not so dirty, as it has cleansing properties. And then there's the fact that I tend to take better care of my clothes in wool". (Laila). But even if these very positive informants all see problems, they also mentioned that 'they have to experience the actual user-situation'. It is also about how often they feel their bedding actually needs laundering.

Some of the informants do not think laundering is a problem, and even less so during winter. Because there is enough "wool to be laundered". (Sara) Because if there are only a few items, it does constitute a problem with laundering when one does not fill the machine. One of the reasons why it might not be easier to care for, is that "wool does not sustain as hot temperatures as cotton. Underpants are next to skin. 40 degrees is fine when it's wool, not when cotton. So when I analyse things, then it's actually cotton that I have to launder at warmer temperatures, because of the rougher surface that attracts stuff. Which wool does not." (Vanja) Also Iris thinks "that I had washed them less often. More if

I had seen that they had been dirty. A spot or something like that, because I think of other woollens and how they act. I think of my national costume. The jacket has never been cleaned. It is like new and I air it when it's cold. I feel guilty that my bedding is not washed often enough, but this would have been a disadvantage compared to wool, I would have continued as normal." (Lise). But then without feeling guilty.

In relation to laundering, the informants are mostly concerned about temperature and imagine that bedding should be washed at a high temperature in order for the textiles to be clean. Some are aware that the effect of washing differs from fibre to fibre, along with that different fibres have different resistance to dirt and soiling. There is little talk of soiling in the interviews. This we believe will be a major problem, not to mention an issue that cannot be solved with higher temperature, rather the contrary. Stains/soiling from body liquids contain the proteins that 'set' with body heat. The lack of effective bleach and stain removers for wool is therefore something we think would be more problematic for our informants (and others).

3.9 Acquiring and at what price-point

What are the informants then willing to pay? This question is obviously theoretical. They have enough difficulty imagining wool bedding, to estimate what they will pay is an even larger speculative step. We have therefore built up this argument through first looking at what they do and pay today, before we present their statements about the price point of a possible future wool bedding.

3.9.1 Sales, gifts and IKEA

Few have an active or conscious relation to the purchases of bedlinen. Several have brought bedlinen with them when they left home or received it as a Christmas gift. "Cannot remember when we bought bedding, we tend to get it for Christmas and stuff like that." (Eva) Tony has what he has because "I have received them as a gift or gotten a gift certificate (...) and I think it's okay because then mother knows what to get us for Christmas (laughter). It's fine." (Tony).

Most provide consistently low prices (100-400 NOK) for past purchases. "I think it was NOK 350. For everything. Nothing fancy." (Mona).

We have asked our informants what they paid for their last purchase. Many mention sales and IKEA as the norm. "I think that the sheets we sleep on cost

SKK 100 at IKEA. Not the best quality then." (Iris) But there are also those who have expensive bed sets. Laila bought a set "last week. Cost 800 NOK for the set. And my partner was a little mad at me because I spent NOK 800 x 2, on new bed-linen when we really had plenty of bedlinen. But I like bedlinen. It was not satin, but some sort of cotton satin, I know that is the way it is woven, but this was a different type of cotton fabric woven with very fine and many threads. It was very cool to the touch and thin, but very strong." (Laila).

We tried to get them to set a price anyway. Mikkel tries "somewhere between 500 and 1000 NOK, it is a bit difficult. Yes, I could just as well have said 2000, if it is made of wool and you know that it is durable, but it's a very theoretical questions. It's hard to put a number on it. I'd go high-end, pay a lot for wool bedding. I would have try it, though. Have the security that it is a good investment. But I happily and willingly pay a thousand for a good t-shirt (in wool). And there is much more wool in a bed set." We see here that his "willingness to pay" rises slightly through his own reasoning. He starts with the uncertain and his experience with what bedlinen costs, and ends up with a comparison with the price of next to skin clothing. What would get you to choose something expensive? we ask. "If it had some quality, f. ex. that you needed to change (it) less often. And that it was more hygienic. Then there would be an argument (to buy). Guaranteed mite-free or something like that. It had to be that kind of reasoning." (Mikkel) He thus wants a clear formulation of the advantage in order to go beyond what is customary to pay in the market.

Ove pulls back in this discussion, "it's not me but the bedding buyers you need to convince" and does not argue on the basis of himself as a customer. "For those with a special interest for a niche product, they might be price-insensitive. They buy it no matter what it costs. For the rest of the 97% of us it is the price-point that counts. And so the question is what is substantially more. It is a 10-fold increase or only double. And then you have to weigh it up against what is actually the benefit. Is it so that you avoid nasty by-products from cotton production that can be carcinogenic, if so you can play with that, and many will go for wool if you can specifically point to big improvements." (Ove) Again we see how tangible benefits are drawn into the argumentation. "What does a cotton bed-set cost? You can buy a cotton (bed-set) for NOK 200. Or you can buy wool for 4000. Is there any difference between them? No, this is wool. (...) The (advantages) have to be listed somewhere. And they must be better in a way that means something to most people." (Ove).

We are now going to those who are in favour of a high price for wool bedding, and they are the informants who already have an idea about wool's benefits in bed textiles, but still the premises is that this can be documented.

3.9.2 An investment

In the interviews, we mentioned three prices we had arrived at through a discussion with *Lindholm Pure*. These were 2500, 3200 or 4000 for a set (pillow- and duvet-cover). (We did not differentiate between NOK and SKK.)

Astrid argues thus: "I have paid 800 NOK or whatever it was for a silk set. 4000 NOK, then we begin to move into the highest (price-point)." 2500, she could however accept, but: "It had to have a certain quality seen that it was in wool, and that I thought that it would solve all my sleep problems." (Astrid) A far higher price than they usually pay requires that the product actually *is* another and better product. Irene has not "spent so much money, the maximum has been 200 SKK per set," for the cotton bedding she now owns, but what does she think about prices in the range of 2500, 3200 or 4000? "It would have to be one at a time, in that case, and for us it is a lot of money as we are so many. So I would probably be the first. (...) What I have seen has had even higher prices. But wool is more expensive." She is, in other words, not surprised at the prices and thinks that the solution is to spend time on the acquisitions. With 7 children, she obviously has many beds to deal with. Neither Astrid nor Irene have high incomes and thus illustrate another important point, that willingness to pay is not necessarily is dependent on income.

"I'd probably be willing to pay more for wool bedding because I assume that it is more expensive to produce and because then I get good quality that with proper care can last." (Lise) Two factors are high-lighted, production costs and lifespan. This is also important for Miriam. "2500 NOK is quite expensive, but I could certainly be willing to pay this, and I could also have been willing to pay more. (...) I really want to buy a bathrobe in cashmere and it costs 4500. It is an extremely high cost for a bathrobe. So I could have been willing to pay much for bedlinen of high quality, but we are not talking about a cotton bedlinen from *Høie*, it must be more exclusive than that. So basically the prices are higher than the ones I usually buy. (..) But I could have been willing to pay more if there had been a good reason for it. Like this shawl, it's so great to wear." The shawl she refers to is in cashmere and she enjoys wearing it. The high price requires that the procurement is perceived "as an investment in a way." (Cecilia).

"2500 SKK, I can imagine ... I would probably think a couple of times before (I would pay this amount). What speaks against is that is that is something I have not tested. And then that represents a lot of money to spend on stuff that has not engaged me much, my bedding. But I'm so (interested) in textiles that if I get engaged in something I become a nerd. So I could. But I have not thought

about this, but 2500 is much, I could not buy this without knowing what it is. It has to be proven that it is utterly fantastic and then it is certainly a very ok price but it is not something you buy and test at that price-point. Considering that the other set has lasted for 20 years. Then you'd need arguments to justify the price. It had to be sewn in Norway, then there is an added value when you know where it is produced, that type of argument, I would need all of them, good animal welfare, no mulesing, the entire spiel." (Vanja) Several things are highlighted here. Vanja can well imagine buying wool bedding for several thousands. However, she would then expect not only that the product is functional, but also that the production is local and transparent. She wants the whole 'spiel' if she is to pay a lot. Mia agrees. "If there was anything that was that good it was perhaps not organic, but good from the outset and the right fibre, then it could command a high price because I like to invest in things (...) I would not think 4000 SKK is a lot of money or expensive. But keeping it for 10 years and spreading the cost to everyday use for 10 years, then it is nothing. I know that it must cost, if it's really good. That amounts to good quality if you do it in a good way." (Mia).

Laila has another, shall we say, more frivolous approach. How much would you pay? we ask. "Unfortunately very much (laughter)." 2500-4000? we ask. "Yes, but it is not uncommon for high quality bedding to cost a lot. We have high quality cotton which costs around 4000. But then the market in Norway is quite different, firstly it is colder longer, compared to Sweden. And people are more accustomed to wool, and people have generally more money in Norway than in Sweden. For Swedes, I think this is high and especially if one thinks that one uses it (only) during winter when it is coldest." But you were not horrified by the price? "No, no. I would be the very happy if it was cheaper than that. But I realize that this is quality and wool. And the wool underwear I have, I have spent a lot of money on, relative to a conventional cotton jersey. When I buy a long-sleeved wool jersey I spend at least 10 times of what I would spend on a cotton jersey. And I'm totally ok with it. I understand why." (Laila) Laila believes that bedding has a greater potential in Norway due to greater understanding of the use of wool, better economy and a colder climate. Although she is positive and refers again to the prices of underwear in wool versus cotton.

Another possible comparison to wool is linen. "Linen is the most expensive; we have a set duvet cover and pillowcase that cost around 1000 SKK. Which has resulted in that we use it a little differently. It will have a longer lifespan both because it was very expensive, but also it has another quality than our other bed sets. We've had it for 10 years now," explains Agnes. 2500? "Hmm. That's over my budget for bedding, but it is easy to understand. I think merino wool is exclusive and then the target group is different than the average person." (Agnes) Higher quality provides a longer life, but we see here that the higher price

also gives or potentially provides for a longer life. It is an interesting argument and clearly in line with previous research on apparel (Klepp 2001).

The same sum (2500) is discussed with Iris in this way. "Yes, if I knew it was a good product and that it was tested and that there was some research backing this up, I think that it had been a pretty reasonable price for one thinks that one can use it very, very long, for 20 years, if I treat them well. Then it's not so much per year. So you have good sleep quality added to your purchase, you're bound to appreciate that." We remind her that this would be a product that is potentially 'super-wash' treated, something she mostly tries to avoid. "My thought is that with super-wash one takes away the ability to absorb moisture. Given that it is chlorine treated first and polyamide is a plastic it clogs the fibre itself. So how can the material absorb moisture? If you have taken away the property and how it wicks?" (Iris) She does not answer the question directly but refers to things she has read and mixes this with their own experiences. However, the main point is that both she and several other presuppose that the beneficial properties need to be documented or that they need to try the products to be convinced, before they buy.

But ultimately we believe Barbro is right. "That everything depends upon how much you love it. Whether it is really wonderful, lovely, beautiful, good in all respects." (Barbro).

We see that high price can be justified when the raw material is expensive and if life-expectancy is long. But equally important is either a love for the product, or that one has been persuaded by good documentation of important characteristics. Some will want added other meta-values, such as animal welfare or a certain production country. However, all these arguments presuppose that the spending-power is available. That the funds can be taken from somewhere.

3.9.3 Way too expensive

Arguments against the stated prices can easily be divided into two. Whether they are primarily not at all realistic, or the lack of good arguments for spending money on bedding. We start with the latter.

2500? Unacceptable? "Yes – (bedding) does not feel like something important." (Roy) "It's a lot. And if one has not even tried it, it is a lot of money to invest in something that could be a pig in a poke." (Miranda) Per is neither interested in wool, nor what he sleeps in. "In this area I would not have gone for something exclusive. I would not shop at *Nille* (very cheap chain, similar to WalMart) or something like that, but something normal. However, I had not invested in

something expensive. (...) No, I had not gone for upscale bedding no matter what. I cannot see what interest I personally would have for something like that." (Per) His willingness to pay is what is the norm. He does not want anything specific, and wants the linen and the price to be 'normal'. "I'd need a pay-rise or (to receive it) as a gift. Two and a half thousand for a bed set, that's a little over-priced I think." (Mona) "It's more than I think I ever would pay for something like that. It's pretty wild." (Eva).

"If I knew it was going to last for many years. If I also knew it would be an improvement, that it would be more comfortable. Maybe I could pay 500 SKK," says Vera. But no more. And it has not just that she does not see the benefits of wool but also that "I would then invest too much in something one knows one can get cheaper". Therefore, the low price of bedlinen generally in the market is a hindrance for buying something that is expensive, even if it's better. This is an interesting argument which, if true, is a serious challenge for the textile industry.

The fact that even people with little money can imagine investing in expensive wool bedlinen does not mean that willingness has something to do economics. One of the youngest in the study reacted to the prices with laughter. "It's super expensive!" (Racha).

3.10 Sweden and Norway

An important aspect of the project was to examine the differences in barriers for the use of wool in bed textiles in Norway compared with Sweden. This has been an underlying question throughout the report, however now at the end we will look more closely at what Norwegian and Swedish informants think about the relationship between the two neighbouring countries. Do we use wool differently? There is going to be a lot of talk about weather, so we'll start with a little refresher-course of the geography. Both Norway and Sweden stretches from north to south with a 1619 km long common border, while Norway stretches from latitude 71 degrees in the north and Sweden tangents 55 degrees in the south. Norway is long and thin and therefore much of Norway is a typical coastal landscape with relatively warm winters with rain. Sweden has more inland area in addition to the coastline. Norway also has larger mountain ranges, where there is snow in winter, not to mention glaciers. The big cities in Sweden are located in the south, while Norway has spread larger cities further out, even far to the north. We have interviewed in Stockholm, Gothenburg and Oslo, and only Oslo has skiing within the city limits and with rather stable winter conditions. On the other hand, Oslo is not especially farther north than Stockholm

(but it is more hilly). Gothenburg is 290 km further south. When we talked about the differences with the informants we tried also to get them to place themselves as wool-users in relation to their friends, and what they thought was normal in their home countries.

3.10.1 Alike

For us it was a truism that Norway uses more wool, and that the market for wool in Norway is higher than in Sweden. This was the starting point for our comparison with Sweden. However, our informants are not equally cocksure.

We start with the Norwegian informants and Mona who says: "I think Norway and Sweden are quite similar. Although Norwegians think we are very different, we're pretty similar to our neighbours." (Mona) "This is only guesswork! The first thing that comes to mind is that we use more wool, but I do not know, I cannot say. I'm guessing in the countryside Swedes use the same amount of wool as we do." (Tina) Sara thinks she is on average for Norway, but does not believe that Sweden is so different. "No. I do not think so. I don't know Sweden very well. It could be that it is because I have seen for myself, the upswing in woollen garments (here). I cannot remember that woollen garments were so easily accessible for children and now it is so easily available in stores. Rema 1000 (grocery store chain) has plenty woollen cardigan tops for children. I do not know if they are (available) in Sweden. But I cannot imagine that the Swedes have a different attitude towards wool than Norwegians." (Sara).

We believe that Norwegians' knowledge about Sweden is greater than the other way around, however we cannot document this very well. Swedish TV channels, music and literature have been (and are) readily available in Norway. While the opposite is not the case. Swedes also have more trouble understanding Norwegian than Norwegians do with Swedish. It is therefore not surprising that the Swedes do not, as Barbro here expresses "have any idea". (Barbro). What she however, can summarise is that she "uses more wool than Swedes generally". Consistently, we can say that both the Swedish and Norwegian informants were more uncertain about whether there was any difference between neighbouring countries in wool-use, with a clear exception and these were the Swedish 'wool lovers'. They are engaged in an idea of Norway as a market for wool, but also that Sweden should follow suit.

3.10.2 Norway as a market

Irene is concerned with the difference between Norway and Sweden. She returns to this several times during the interview. Where do you get your (knitting) wool from? we ask. "Norwegian sheep. Of course. I mostly buy online." A number of the products she wants "have not been so easy to find in Sweden". She has a tendency to "buy from Norway online and partly to pester "Swedish stores". But can she explain why there is a difference? "I really do not know. But in Norway we have the more natural and more mountains and more cold. But I do not know, I find it strange that Sweden has less wool." (Irene).

Laila is a half Norwegian wool-lover living in Gothenburg and very market-conscious. She totally agrees with Iris. "Availability is easy in Norway and (there is) a greater variety. You can in principle choose what you want and what colours you want and patterns and models and everything. In Sweden you have much less choice. Yes, it is increasing, but you usually go to like 'survival sports stores' to buy wool sports equipment. And there everything is black or with a sports pattern. Nothing else has been available. But in Norway, for children, you can get patterned, striped and my son has a teddy bear pattern, and this is just not available in Sweden. And I've searched. I cannot find (...) My sister lives in Bergen, and she usually buys for me, so I just call and she buys." (Laila).

Laila also thinks there are differences both within traditional garment use and within crafts, as well as sports use. "Knit sweaters and wool cardigans and stuff. There you will find more variation in Norway (..) and that the knitted sweaters for children are hand-knitted. My own sweaters are both purchased and hand-knitted. For the kids we have hand-knitted and store-bought underwear and hand-knitted mittens, socks and hats." She illustrates what Roy said; that hand-knitting is more common. Our Norwegian informants had talked much more about this topic than we have reported or this has not been included in the report precisely because the theme has been the use of merino. Traditional wool use has therefore not been in focus, but may be important to illustrate a difference between the two countries.

3.10.3 Poor Norwegians and rich Swedes

We previously heard that Norwegians have more money than the Swedes. Of course, this is related to the discovery of oil in the North Sea and the fishing industry. But historically, Sweden has not only been larger, richer and politically more important; Norway was a province in Sweden in the period 1814 until 1905, when Norway was given to Sweden as booty after Denmark was on

the 'wrong side' in the Napoleonic Wars. Before 1814 Norway was under Danish rule for more than 400 years. Norway was, in other words, the poor little brother that suddenly grew up. A change that actually resonances with the most popular fairy tale in Norway, 'The Cinder Lad', a fairy tale that mirrors Cinderella but with a male protagonist. We will now see how the informants use history as a justification for different use of wool, starting with Norway.

Ove believes that Norwegians' and Swedes' wool use is different because "we are very different in very many other ways as well. I assume. Norway has had a more equal labour class and been more equal, while the Swedes have had nobility. Maybe Swedes use wool, and perhaps this is being prejudiced, but when you think of them as wool-users it's wool suits in their castles, while we would be wearing wool in the fields. But I think we use wool as the Scots use wool. So Norwegians are like Scots and Swedes are like the British." (Ove) This assumption makes sense, in Norway we have f. ex a strong and vibrant tradition of national costumes. Although this is mostly used by men in Scotland and by women in Norway (Klepp, Vramo & Laitala, 2014), the actual link between the clothes and wool and national feeling is similar, and we will come back to this.

3.10.4 Norwegian identity and traditional clothing

In their description of the difference, the Swedes do not refer to our countries different histories, but they still say something about how woollens are part of the culture today. The story is more indirectly through several Swedes pointing to the Norwegian wool use as more "traditional". This indicates that history in some way or another is more present or important in Norway.

Agnes: "I experience Norway as more tradition-heavy, a country with a rich tradition (laughs)." "I think that it's a Norwegian thing that wool is Norwegian and that all Norwegians wear woollen sweaters." (Cecilia) Iris thinks that Norwegians use the most wool. "You have a bit more in your culture than we have. To go for a walk and wear sweaters more. (...) A (Norwegian) cardigan would not be a cardigan in cotton. I imagine that you have a different relationship to nature than we Swedes have." "Yes, I think the *lusekofte* (traditional Norwegian sweater) and national costume. That there is more tradition in Norway. And winter sports and stuff. These are more prevalent in Norway as are similar things. Cabins and hiking in the mountains. Skiing." (Cissi) Miranda thinks that she is like "most Swedes in general. I think I have a suit perhaps in wool but not large quantities. Much more so in Norway. Sweaters and those national costumes. Those Norwegian classic sweaters. We used to have them in Sweden before, patterned, but not anymore". (Miranda) "You are perhaps more aware

of the history behind the clothes. And more national in general than the Swedes are. (Laughter.) And then you have a longer tradition with the nice knitted sweaters." (Charlotte) There is more wool in Norway partly because "the national costume movement is quite strong". (Vanja).

Roy is keen on traditions. "I have a prejudice that there is a greater proportion of people in Norway who use crafts and wood work than in Sweden, but I do not know if that's right. That in Norway more live, perhaps not in the countryside, there are some larger towns in Norway, but that more live in cities of Sweden's population. And I think my wife's family f. ex. who come from Helsingland, there it is more common that people do not have to be old in order to knit. The everyday traditions are more common in Norway." (Roy) He describes a more urban and modern population in Sweden, while Norway has a larger population in smaller towns and a more vibrant craft tradition. And he is probably right. Norway has several large spinning mills that supply, and have supplied knitting yarn to the domestic market (Hebrok *et al.*, 2012) and hand knitted sweaters are in daily use in Norway, as we have several examples of in the report.

3.10.5 Sporty cabin-users

Sports, especially skiing is mentioned together with tradition in several of the above quotes. The Norwegian relationship to what in Norway is called 'outdoor-life' is something both Norwegian and Swedish informants quickly mention when differences are described. Norwegian informants say e.g. "we go hiking more in the mountains than Swedes. And with that more wool comes in and we have lots of polar explorers." (Ove) "The only thing I can think of is that Norwegians have more outdoor activities and I imagine that Norwegians use more wool when they are at the cabin. So maybe Norwegians use more wool than the Swedes." (Per) "I would think that Norwegians use a little more wool, but I'm not sure, however our tradition of skiing and wool belongs somehow. Although Swedes also go skiing." (Miriam).

The Swedish informants agree. "In general you are more sporty and almost all have cabins and go hiking." (Charlotte). Vanja has "these prejudices about Norwegians who hike in their knitted knee socks and go Telemark-skiing downhill in their felted wool trousers. (Laughter.) I get the feeling that the wool is slightly more present in Norway." (Vanja). Emma says that "Norwegians certainly use more wool than Swedes. Because they use so much outdoor hiking clothing." (Emma) This she says despite the fact that she uses wool in a number of other settings than for hiking.

3.10.6 Norwegian toddlers, age and generations

As we have seen previously, there was much talk about the attire of toddlers in the interview with Ove. "All Norwegian children dress the same. In winter, they play in only their wool underwear. And then they put on the down one-piece over that when they are outside. And a wool hat. Wool mittens." (Ove) Eva totally agrees. "At least for children's clothes, I have the impression that it is more common with wool in Norway than in Sweden. And that we in Norway are even a little more concerned that it should be natural fibres. As I participate in knitting forums, both Norwegian and Swedish, and follow several on Instagram, I see this there. Perhaps I have the impression that kindergarten clothes are made of wool in Norway more than in Sweden. For in Norway it is very common in kindergartens. We constantly receive like notes and letters (where they) write 'remember that the children must have wool clothes under the outdoor one-piece'. They say it all the time ... "(Eva) 'Explicitly' we add.

But what about adults. Is there any difference. Eva says: "I do not know." (Eva) But several tell us that they themselves, as adults, use more than before. Astrid, e.g: "I use a lot more wool now than when I was a young adult." And those who do not use wool in Norway perceive themselves as different than other Norwegians. "I do not think I'm representative, in that I did not use any." (Per) "I do not know what is normal," says Eva. "In my family, we use probably more wool because we have children" and "personally, perhaps a little more wool than average" because she knits. (Eva) Eva does not know what is normal, however at the same time she takes for granted that those who knit, knit with wool, and that families with children have more wool than families without children. Neither is necessarily a law, but something she perceives. However, if Norwegian infants have much more wool than 20 years ago, it also raises the question of whether this is going to propagate upwards into older age-groups through them. Does the change only concern this age group or will it also apply to the entire generation? Only better studies of children's dressing-habits in Norway can answer this. And answer why this is different in Sweden.

3.10.7 Difference between Sweden and Norway

Until now we have seen what the informants say when we ask them. However, there is also a difference in what they say when the issue of country is not the theme. It is a difficult question because there is also great variation between the informants in relation to what they know and how much experience they have with using wool. We think that informants from both countries link traditional wool use to knits and national costumes, and to Norwegian history. In both countries there is an idea that Norwegians are more active outdoors, more at the

cabin and above all skiing more than Swedes. But the Swedes are unaware of, or not concerned about the difference in the attire of the youngest. The exception to this are the real 'wool-lovers' in Sweden who use Norway as a marketplace and role model for dressing their children.

Along the way, we have also seen other differences such as greater variation in wool laundry practices among Swedes. And both old-fashion washing methods and outdated perceptions that wool must 'itch' among Swedes. At the same time, we also have the most dedicated wool-lovers among our Swedish informants. And they constitute perhaps the biggest difference between the countries? Norwegian wool-lovers take their wool use for granted and use of wool in general is not seen as something 'alternative' in general. Are the Swedish wool-lovers special? They put far greater emphasis on ideological matters such as animal welfare and the absence of chemical treatments for their wool, and fight a battle against the market and a less wool-friendly school. In Norway, however 'the wool children' are the norm and some of the mothers even think it has always been that way.

4 Material test

4.1 Introduction

All informants that were interviewed also participated in the material sample-test. A list of the participants with their background information can be found in chapter 2.2 of this report. This part of the analysis is done quantitatively, so we do not refer to their names but use groups based on country, gender, and age.

The method is based on the sample-testing SIFO has developed which already has shown some interesting and relevant results (Hebrok & Klepp, 2014; Klepp, Hebrok & Laitala, 2013). The aim of the material tests is to survey actual material choices and barriers for use. A collection of different material samples was presented to the informants and they were asked specific questions related to each sample, and the answers were recorded.

Materials were selected in order to include some variation in fibre types, colours, fabric structures, fibre fineness, weight etc., however the main focus was merino wool samples that could be suitable for use in bed, either as bedlinen or nightwear. Some of the additional samples were included in order to have contrasting materials, where some are normal in bedlinen or nightwear, and some are unusual or less suitable for these use areas.

The informants were not informed beforehand of the material content of each sample, but they were told that the majority of them were made of wool.

4.2 Method

First, the informants were asked to pick a random sample, say the number loud for the recording, feel the samples, describe how they looked and felt, explain

what they thought of them, and if they would wear it next-to-skin. We also asked them to guess which material the samples were made of, but we tried not to make this the focus of the test and told them the correct answer right after they made the guess. Afterwards, when all samples were gone through one by one, we asked the informants to sort the textile samples into different categories:

1. Which two materials are your favourite for use as duvet covers?
2. Which two materials are your favourite for use as nightwear?
3. Which materials are definitely not usable as bed linen nor nightwear?
Select as many samples as needed.

This test not only allowed us to study which samples are identified correctly or incorrectly, the recordings of how the informants reasoned with themselves in order to establish a perception of the fabric also gave us insight into how the informants made their guesses and what kinds of attitudes, expectations and associations they have for each of the textiles. However, as the material test interviews took on average 30-40 minutes and full analysis of almost 20 hours of interview recordings is very time-consuming and outside the scope of this project, we have used mainly our notes made during the interviews for this part of the analysis. Therefore, there still a potential to analyse this material further and to have a more detailed understanding related to the descriptions that the informants gave.

4.2.1 Samples

Information that is included for the materials that were selected for the tests include their structure, colour/pattern, fibre content and application area. Where available, even more detailed technical information such as wool fibre thickness, and square weight are included. Table 13 gives a short list of the samples while Appendix 3 includes the complete overview with more details, and Appendix 4 shows photos of them.

The average sample size was about 15 cm × 15 cm. however, in some cases there was lack of material and smaller samples had to be used (as a minimum 8 × 14 cm).

Table 13: List of fabric samples

Sample number	Short description
1	Woven merino 16.25 µm, grey (Lindholm pure-Morrgott)
2	Rib-knit, 20.5 µm merino, black, 190 g/m ² (Aclima)
3	Natural white jersey knit 14.5 µm merino (AWI)
4	Blue jersey knit 17.5 µm merino, 140 g/m ² (Aclima)
5	Woven silk, red with flower print (SIFO)
6	Grey weave <18.5 µm merino, 230 g/m ² (Lindholm pure-Morrgott)
7	Woven twill purple/black with fishbone stripes 15.75 µm merino, 250/270 g/m ² (Lindholm pure-JH Clissold)
8	Blue jersey knit 17.5 µm merino, 160 g/m ² (AWI)
9	Black woven <18.5 µm merino, 280/300 g/m ² (Lindholm pure-JH Clissold)
10	Woven cotton, blue with flower print (SIFO)
11	Green jersey knit 18.15 µm merino, 145 g/m ² (AWI)
12	Green thick terry knit, 65% merino (20,5 µm), 20% polyester, 15% polyamide (Aclima)
13	Woven grey with pink stripes 15.75 µm merino, 290/310 g/m ² (Lindholm pure-JH Clissold)
14	Black interlock knit, 20.5 µm merino (Aclima)
15	Purple Jacquard wool weave with flowers (Krivi vev)
16	Woven 65% Polyester, 35% Cotton, white bed sheet material (SIFO)
17	Woven grey/purple checks, <18.5 µm merino, 270 g/m ² (Lindholm pure-JH Clissold)
18	Woolnet 80% merino (20.5 µm) 20% polyamide (Aclima)
19	Striped white and grey jersey knit 17.5 µm merino, 140 g/m ² (AWI)
20	Yellow Krivi wool weave with stripes (Krivi vev)
21	Woven flannel with purple checks, merino, 275 g/m ² (Lindholm pure-Ipekis)
22	Natural white interlock knit 20.5 µm merino, 200/238 g/m ² (Aclima)
23	Grey jersey knit 17.5 µm merino, 175 g/m ² (AWI)
24	Woven linen, natural grey (Krivi vev)
25	Red jersey knit 17.5 µm merino, 140 g/m ² (Aclima)
26	Norwegian VikingGold wool, woven (SIFO)
27	Viscose, plain woven white (SIFO)
28	Polyester microfibre, white, knitted (Nike Dri-FIT)

During the material test, we observed that there were too many samples in the test, as the informants tired and did not notice differences between the thin merino wool samples. Therefore, we removed two samples, number 6 and number

8, and results from the first interviews where they were included, are not included in this analysis.

For evaluating the effect of colour, the test included two pairs of the same samples in different colours. These were Aclima Lightwool single jersey samples 4 (light blue) and 25 (red), and Aclima Warm wool interlock samples 14 (black) and 22 (natural white). The nightwear material in user trials is the same as the Lightwool samples.

Lindholm pure has used samples 1 and 6 in production samples of duvet and pillow covers for the user trials (although 6 is in different colour).

The wool fibre fineness was given in different ways for the samples. Table 14 shows how these values were transferred to microns.

Table 14: Wool fibre fineness descriptions

Quality description	Fibre diameter
SUPER 80's	19.75 µm
SUPER 90's	19.25 µm
SUPER 100's	18.75 µm
SUPER 110's	18.25 µm
SUPER 120's	17.75 µm
SUPER 130's	17.25 µm
SUPER 140's	16.75 µm
SUPER 150's	16.25 µm
SUPER 160's	15.75 µm
SUPER 170's	15.25 µm
SUPER 180's	14.75 µm
SUPER 190's	14.25 µm
SUPER 200's	13.75 µm
SUPER 210's	13.25 µm
SUPER 220's	12.75 µm
SUPER 230's	12.25 µm
SUPER 240's	11.75 µm
SUPER 250's	11.25 µm
Ultrafine Merino	< 15.5
Superfine Merino	15.6 – 18.5
Fine Merino	18.6 – 20
Medium Merino	20.1 – 23
Strong Merino	> 23

4.3 Results

4.3.1 Evaluation of each material

For each of the samples, the informants were to indicate whether they could use it for nightwear, duvet cover, sheet or pillowcase. The top results are given in Table 15.

Table 15: Products accepted by most informants

Most acceptable nightwear	Most acceptable duvet covers	Most acceptable sheets	Most acceptable pillowcases
4 knitted merino	1 woven merino	1 woven merino	10 woven cotton
11 knitted merino	10 woven cotton	10 woven cotton	1 woven merino
3 knitted merino	13 woven merino	4 knitted merino	13 woven merino
23 knitted merino	17 woven merino	27 woven viscose	27 woven viscose
25 knitted merino	27 woven viscose	13 woven merino	17 woven merino
19 knitted merino			

For nightwear, the informants were most positive to the thinnest merino jersey knits with low micron counts.

For bed materials, the woven merino wool (sample 1) was most popular, followed by cotton weave (sample 10). Other popular materials were woven merino 13 and woven viscose 27, for sheets jersey knit in thin merino 4 and for duvet covers/pillow cases woven merino 17.

4.3.2 Favourite materials

At the end of the test, the informants picked two favourite materials for nightwear and duvet covers. These results are given in Table 16.

Table 16: Favourite samples for nightwear and duvet covers

	Sample No.	Description	Number of informants that selected sample as favourite
Nightwear	3	Natural white jersey knit 14.5 μm merino (AWI)	13
	19	Striped white and grey jersey knit 17.5 μm merino, 140 g/m ² (AWI)	8
	11	Green jersey knit 18.15 μm merino, 145 g/m ² (AWI)	7
	25	Red jersey knit 17.5 μm merino, 140 g/m ² (Aclima)	6
Duvet cover	1	Woven merino 16.25 μm , grey (Lindholm pure)	9
	13	Woven grey with pink stripes 15.75 μm merino, 290/310 g/m ² (Lindholm pure)	9
	4	Blue jersey knit 17.5 μm merino, 140 g/m ² (Aclima)	5

4.3.3 Least favourite materials for sleep

At the end of the test, the informants were told to pick out all the materials that they could not think to use in bed, neither as bedlinen nor as nightwear. These results are given in Table 17.

The informants were negative to synthetic materials, and the sports t-shirt in polyester microfiber dri-fit (28) was the least popular sample in test, followed by the Norwegian VikingGold wool sample (26) that was considered too coarse. The third least favourite material was knitted wool net (18), which the informants did not prefer due to the structure with holes in it. This was followed by a coarse wool sample (20). Sample 16 resembles regular bed sheet materials, but informants became negative towards this when they heard it included 65% polyester. Informants were least negative to the thin merino knits.

However, it was clear that informants did not only react to the fibres in the samples, but also to the structure, thickness, elasticity and other properties they could observe.

Table 17: Evaluation of samples least suitable for use in bed

Sam- ple num- ber	Short description	Selected un- usable [per cent of respondents]
28	Polyester microfibre (white, knitted Dri-FIT)	89 %
26	Norwegian VikingGold wool, woven	86 %
18	Woolnet 80% merino (20.5 µm) 20% polyamide	79 %
20	Yellow Krivi wool weave with stripes	79 %
16	Woven 65% Polyester, 35% Cotton, white bed sheet material	75 %
12	Green thick terry knit, 65% merino (20,5 µm), 20% polyester, 15% polyamide	68 %
5	Woven silk, red with flower print	61 %
15	Purple Jacquard wool weave with flowers	61 %
24	Woven linen, natural grey	57 %
9	Black woven <18.5 µm merino, 280/300 g/m ²	54 %
7	Woven twill purple/black with fishbone stripes 15.75 µm merino, 250/270 g/m ²	43 %
17	Woven grey/purple checks, <18.5 µm merino, 270 g/m ²	43 %
27	Viscose, plain woven white	43 %
10	Woven cotton, blue with flower print	36 %
21	Woven flannel with purple checks, merino, 275 g/m ²	36 %
13	Woven grey with pink stripes 15.75 µm merino, 290/310 g/m ²	32 %
1	Woven merino 16.25 µm, grey	29 %
2	Rib-knit, 20.5 µm merino, black, 190 g/m ²	21 %
22	Natural white interlock knit 20.5 µm merino, 200/238 g/m ²	21 %
14	Black interlock knit, 20.5 µm merino	18 %
19	Striped white and grey jersey knit 17.5 µm merino, 140 g/m ²	14 %
3	Natural white jersey knit 14.5 µm merino	7 %
25	Red jersey knit 17.5 µm merino, 140 g/m ²	7 %
4	Blue jersey knit 17.5 µm merino, 140 g/m ²	4 %
11	Green jersey knit 18.15 µm merino, 145 g/m ²	4 %
23	Grey jersey knit 17.5 µm merino, 175 g/m ²	4 %

(Missing values excluded from percentage calculations)

4.3.4 Nightwear and duvet cover comparisons

It was clear that there were inconsistencies in the answers that informants gave between the different parts of the test. They got a better overview of available fabric types during the test, and modified their answers from the beginning when each sample was discussed separately, to the end where they had to select two favourite samples and take out all the samples that were 'not acceptable' for either purpose. Therefore, in order to be able to get a better overview based on more than one of the evaluations, two scores were calculated based on three separate questions for nightwear and duvet covers:

1. First evaluation of acceptability as nightwear/duvet cover: +1 points for yes, +0.5 points for maybe, zero for non-suitability.
2. Second evaluation of picking out all samples that are not acceptable in a bed: -2 points for selected unsuitable.
3. Third evaluation at the end when the informants could pick two favourite samples for nightwear and duvet cover use: + 2points for each of the two samples, the rest of samples got zero points.

This way, the samples could receive points from -2 to +3 in total for each of the use areas.

Nightwear

The average results for nightwear are given in Table 18, the highest evaluated samples on top of the table and the worst evaluations at the bottom. The table includes the average results for each sample, followed by evaluations by women and men, Norwegians and Swedes, and three different age groups. Colour coding indicates the most positive answers in darkest green and most negative answers in the darkest red.

The same samples rank highest as the samples accepted by most informants (3, 11, 4, 25, 19 and 23). However, this overview gives some more information of the differences between the informants who evaluated them. Women were in general slightly more positive to the samples than men for use of the fabrics in nightwear, but this cannot be considered to be a significant difference applicable to the population as the number of informants in general is low (especially male informants). Another cause for the difference could be that larger portion of female respondents were textile/wool experts than of the male respondents.

In addition, a larger portion of men were negative to wearing nightwear in general, as they more often reported being too warm at night.

Table 18: Evaluation of samples for use in nightwear

Sample No.	Average	Gender		Country		Age		
		Fe-male	Male	Norway	Sweden	25-34	35-49	50-72
3	1,8	1,9	1,0	2,0	1,5	2,4	1,5	1,3
11	1,4	1,3	2,0	1,4	1,4	1,2	1,3	1,9
4	1,2	1,2	1,5	1,4	1,0	1,0	1,2	1,5
25	1,1	1,2	1,0	0,9	1,3	0,5	1,6	1,3
19	1,1	1,2	0,3	1,4	0,9	1,5	0,5	1,4
23	1,1	1,1	1,1	1,0	1,2	1,0	1,0	1,4
14	0,6	0,6	0,5	0,6	0,6	0,4	1,1	0,1
22	0,3	0,3	0,5	0,4	0,3	-0,3	0,5	0,9
2	0,3	0,2	0,8	0,2	0,3	-0,5	0,8	0,4
13	-0,4	-0,3	-0,8	-0,5	-0,2	-0,4	-0,9	0,5
7	-0,4	-0,3	-1,0	-0,6	-0,1	-0,5	-0,8	0,4
21	-0,4	-0,4	-0,4	-0,3	-0,5	-0,1	-1,0	0,2
1	-0,4	-0,4	-0,4	-0,6	-0,2	-1,0	-0,3	0,2
10	-0,4	-0,4	-0,4	-0,3	-0,5	-0,6	-0,6	0,1
27	-0,5	-0,5	-0,6	-0,3	-0,7	-0,4	-0,4	-0,9
17	-0,6	-0,5	-1,0	-0,9	-0,3	-1,0	-1,0	0,5
5	-0,7	-0,5	-1,8	-0,8	-0,6	-1,1	-0,8	-0,1
24	-0,9	-0,8	-1,3	-1,4	-0,3	-1,6	-0,6	-0,3
9	-0,9	-0,8	-1,3	-0,8	-1,0	-0,9	-1,5	0,0
12	-1,1	-1,0	-2,0	-1,5	-0,8	-1,0	-1,2	-1,3
15	-1,2	-1,0	-2,0	-1,4	-0,9	-1,6	-1,4	-0,1
18	-1,2	-1,0	-2,0	-1,0	-1,3	-1,2	-1,6	-0,5
20	-1,3	-1,4	-1,0	-1,5	-1,1	-1,9	-1,2	-0,8
16	-1,4	-1,5	-0,5	-1,5	-1,3	-2,0	-1,1	-1,1
26	-1,5	-1,5	-1,2	-1,7	-1,3	-1,9	-1,1	-1,5
28	-1,7	-1,6	-1,8	-1,8	-1,5	-2,0	-1,7	-1,2
Total	-0,2	-0,2	-0,4	-0,3	-0,2	-0,4	-0,3	0,2

There were no great differences between the two countries, although Norwegians in general had more extreme scores at both ends of the scale than Swedes who did not find as big differences between the samples. Norwegians agreed more on what they thought was suitable for nightwear use and what was not.

The informants above the age of 50 were in general more positive to the samples than the informants below the age of 50, but all informants above the age of 50 were women.

The colour difference between similar samples 4 and 25 did not play any significant role for the average evaluation for use in nightwear, but the blue sample 4 was evaluated slightly higher (0.1 points) than the red 25, mainly because men and Norwegians preferred the blue sample. Similarly, samples 14 and 22 were also evaluated next to each other, with a slight preference of 0.3 points for the black sample 14 when compared with the natural white sample 22.

Duvet covers

Duvet cover results were analysed and colour coded in a similar way as in the previous table for nightwear, and the results are organised in Table 19 from the most positive to the most negative evaluations.

The results differ from the nightwear evaluations, as respondents are less unison in their evaluations on what are the most suitable materials for duvet covers (lower average scores than those for nightwear). The top three samples 4, 1 and 13 are also found on the favourites list, but the rest of the samples vary in order.

For duvets, the difference between genders is opposite to that of nightwear, as here men were in general slightly more positive to a larger portion of the samples than women were. However, this result cannot be considered to be a significant difference applicable to the population as the number of informants in general is low (especially male informants). In addition, men were somewhat more negative to the samples at the bottom of the table.

There is no significant difference between the countries in average values in selection of duvet covers. However, the evaluations vary for some specific samples. Swedes are much more positive to the use of linen (the fibre) for bed-linen. This difference was already observed in the interviews, where many of the informants mentioned having used linen in their beds earlier.

The difference between age groups is similar to that of nightwear; informants above the age of 50 were in general more positive to the samples and especially the youngest age groups below the age of 34 were more negative.

Table 19: Evaluation of samples for use in duvet covers

Sample No.	Average	Gender		Country		Age		
		Female	Male	Norway	Sweden	25-34	35-49	50-72
4	0,8	0,7	1,2	1,2	0,5	0,9	0,7	1,0
1	0,8	0,7	1,2	0,6	0,9	0,1	1,2	0,9
13	0,7	0,8	0,3	0,7	0,6	0,6	0,1	1,8
3	0,6	0,5	0,8	0,7	0,4	0,8	0,3	0,7
23	0,5	0,4	0,8	0,5	0,5	0,3	0,3	1,1
25	0,5	0,4	0,9	0,6	0,4	0,1	0,7	0,6
11	0,4	0,3	0,6	0,4	0,4	0,3	0,3	0,6
19	0,3	0,3	0,2	0,7	-0,2	0,8	-0,1	0,1
10	0,2	0,2	0,2	0,3	0,1	0,0	0,2	0,4
17	0,1	0,1	0,4	-0,4	0,6	-0,6	-0,1	1,4
21	0,1	-0,1	1,0	0,5	-0,3	0,0	-0,3	0,9
14	0,1	0,0	0,2	0,2	-0,1	0,1	0,2	-0,1
7	0,1	0,2	-0,6	0,1	0,0	-0,3	-0,6	1,4
27	0,0	-0,1	0,2	0,0	0,0	-0,2	0,5	-0,6
2	-0,1	-0,1	-0,1	0,0	-0,2	-0,6	0,0	0,4
22	-0,1	-0,2	0,1	0,0	-0,3	-0,7	0,1	0,2
24	-0,5	-0,5	-0,9	-1,2	0,1	-1,6	-0,1	0,3
9	-0,6	-0,6	-0,6	-0,4	-0,7	-0,6	-1,1	0,3
15	-0,6	-0,5	-1,2	-0,9	-0,4	-1,3	-1,0	0,9
5	-0,8	-0,7	-1,4	-1,0	-0,7	-1,2	-0,8	-0,4
16	-0,9	-1,0	0,0	-1,1	-0,6	-1,7	-0,2	-0,8
12	-1,0	-0,8	-1,6	-1,2	-0,7	-1,3	-0,7	-1,0
20	-1,2	-1,1	-1,4	-1,3	-1,0	-1,9	-1,3	0,0
18	-1,4	-1,4	-1,6	-1,3	-1,5	-1,6	-1,6	-0,9
26	-1,5	-1,4	-1,6	-1,8	-1,1	-1,9	-1,1	-1,5
28	-1,7	-1,7	-1,6	-1,7	-1,6	-2,0	-1,7	-1,3
Total	-0,2	-0,2	-0,1	-0,2	-0,2	-0,5	-0,2	0,2

The similar sample pairs with only colour differences were further apart from each other in the list than in the nightwear results, but the difference in evaluation points was as little as for the nightwear. The blue sample 4 got evaluated 0.3 points higher than the red 25. The black sample 14 got 0.2 points more than the natural white sample 22. This result is opposite to the interview results, where a larger portion of the informants preferred white for bed linen. However, natural white may not have the same feeling of luxury that was described to be connected to the pure white samples.

4.3.5 Sample descriptions

We recorded the evaluation the informants gave for each sample at the beginning of the test. Table 20 tries to give a main summary of these recordings based on what kind of comments were common. However, it is only an overview and does not include many details nor the differing opinions, only the main summarising descriptions.

Table 20: Examples of informants' common evaluations of the samples

Sample No.	Short description	Some evaluations by informants
1	Woven merino 16.25 µm, grey (Lindholm pure-Morrgott)	Bit stiff, but still soft and OK to have next-to-skin. Could be used as bed linen but too stiff/non-flexible for nightwear
2	Rib-knit, 20.5 µm merino, black, 190 g/m ² (Aclima)	Bit thicker and very elastic. More suited for winter underwear. Could cause prickle.
3	Natural white jersey knit 14.5 µm merino (AWI)	Very thin, transparent, soft, OK next-to-skin.
4	Blue jersey knit 17.5 µm merino, 140 g/m ² (Aclima)	Mainly positive reactions, comfortable, thin, elastic, OK for next-to-skin.
5	Woven silk, red with flower print (SIFO)	Too smooth/slippy, thin, feels synthetic. Many negative reactions but some said it could be used for nightwear or travel bed sheets.
7	Woven twill purple/black with fishbone stripes 15.75 µm merino, 250/270 g/m ² (Lindholm pure-JH Clissold)	Shiny and smooth, but more suited for other products than nightwear.
9	Black woven <18.5 µm merino, 280/300 g/m ² (Lindholm pure-JH Clissold)	Can be a bit too dense and sleek, but some positive to bed linen and most for other types of products
10	Woven cotton, blue with flower print (SIFO)	Mainly positive but some think the sample is too thin for bed linen and not elastic enough for nightwear. Most did not like the flower pattern.
11	Green jersey knit 18.15 µm merino, 145 g/m ² (AWI)	Comfortable, thin, but many negative to colour. OK for next-to-skin nightwear.
12	Green thick terry knit, 65% merino (20,5 µm), 20% polyester, 15% polyamide (Aclima)	Soft terry cloth, suitable for sweaters. Some could think to use it for winter in bed.
13	Woven grey with pink stripes 15.75 µm merino, 290/310 g/m ² (Lindholm pure-JH Clissold)	Soft, bit hairy surface, most OK for having it next to skin but evaluated more suited for other clothing.
14	Black interlock knit, 20.5 µm merino (Aclima)	Bit too thick and elastic, hairy surface, but soft.
15	Purple Jacquard wool weave with flowers (Krivi vev)	Too stiff and rough for bed, nice as tablecloth or other use.

Sample No.	Short description	Some evaluations by informants
16	Woven 65% Polyester, 35% Cotton, white bed sheet material (SIFO)	Bit stiff, reminds of regular sheets. Could otherwise use as bed linen but don't like polyester.
17	Woven grey/purple checks, <18.5 µm merino, 270 g/m ² (Lindholm pure-JH Clissold)	Thick, stiff, and shiny. Pattern reminds of pyjamas. Some could wear it next-to-skin.
18	Woolnet 80% merino (20.5 µm) 20% polyamide (Aclima)	Too many holes to sleep in, only OK for underwear.
19	Striped white and grey jersey knit 17.5 µm merino, 140 g/m ² (AWI)	Thin, not as soft as some other similar samples. Some liked stripes, others not.
20	Yellow Krivi wool weave with stripes (Krivi vev)	Too rough, prickles and itches. Suitable for curtains or tablecloth
21	Woven flannel with purple checks, merino, 275 g/m ² (Lindholm pure-Ipekis)	Bit itchy and coarse, most suited for decorative pillow or blanket. Some think suitable for bed linen.
22	Natural white interlock knit 20.5 µm merino, 200/238 g/m ² (Aclima)	Soft but too thick and warm for nightwear, more suitable for other clothing
23	Grey jersey knit 17.5 µm merino, 175 g/m ² (AWI)	Seems similar to other samples but has more pilling. Very thin, transparent. Not too rough or electrostatic
24	Woven linen, natural grey (Krivi vev)	Too rough for sleeping, gets wrinkled, more suited for furniture.
25	Red jersey knit 17.5 µm merino, 140 g/m ² (Aclima)	Quite elastic and thin. OK to have it next-to-skin.
26	Norwegian VikingGold wool, woven (SIFO)	It prickles; it is as people think of wool. Stiff and rough, not against skin or for sleeping. Looks nice, could be used for something else.
27	Viscose, plain woven white (SIFO)	OK for bedsheets/duvet covers, but seems quite thin. Comfortable next-to-skin, does not itch.
28	Polyester microfibre, white, knitted (Nike Dri-FIT)	Synthetic. Not suitable for sleeping. Sportswear.

4.3.6 Importance of fabric structure and wool fibre fineness

Table 9 includes average ratings for woollen samples grouped by square weight and micron count for use in nightwear or duvet covers. Informants had different preferences for type of sheets. In Norway, it is most common to use woven cotton sheets, but also terry/flannel sheets or knitted stretch sheets are available.

Some of the informants were used to these and preferred knitted qualities, while the ones used to woven qualities were more likely to choose woven sheets. However, some also selected the thin knitted merino qualities as they thought they could be comfortable for that use area due to their softness. The test included three coarser wool (non-merino) samples, and these were not popular for use in bed.

Table 21: Evaluation of woollen samples

Type of wool	Square weight	Micron	Mean evaluation for nightwear	Mean evaluation for duvet cover
Knitted merino	120-190 g/m ²	17,5	1,1	0,5
		18,1	1,4	0,4
		20,5	0,3	-0,1
	200-300 g/m ²	20,5	0,5	0,0
Woven merino	200-300 g/m ²	(missing)	-0,4	0,1
		15,75	-0,4	0,4
		18,5	-0,7	-0,2
Woven wool (not merino)	Over 200 g/m ²	Coarse	-1,3	-1,1

4.3.7 Fibre recognition

Many of the informants were surprised in the beginning of the material test in relation to the different types of wool samples available, but then learnt quickly to recognise wool during the test.

The answer was registered as almost correct, if at least one of the fibres was recognised correctly, for example if the informant guessed something made of wool was a wool-mix, or when they assumed polyester-cotton was made of cotton. The missing answers for when informants did not say anything about the fibre content are excluded from the results, and thus the correct percentages may be a bit higher than if they were recorded as wrong answers.

The informants had most trouble guessing the fibre content of the viscose sample. This was followed by the woolnet sample that they thought was pure wool instead of a wool-polyamide mix, the silk sample that many thought was synthetic, and the polyester-cotton sample that many thought was cotton.

They guessed that the thicker and/or coarser wool samples were made of pure wool more often than the thinnest woollen samples.

Table 22: Percentage of correct answers divided by country

Sample No.	Description	Mean	Norway	Sweden
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13	Woven grey with pink stripes 15.75 µm merino, 290/310 g/m ² (Lindholm pure-JH Clissold)	98 %	100 %	96 %
2	Rib-knit, 20.5 µm merino, black, 190 g/m ² (Aclima)	96 %	100 %	93 %
22	Natural white interlock knit 20.5 µm merino, 200/238 g/m ² (Aclima)	91 %	93 %	89 %
23	Grey jersey knit 17.5 µm merino, 175 g/m ² (AWI)	89 %	89 %	88 %
26	Norwegian Viking wool, woven (SIFO)	88 %	88 %	89 %
4	Blue jersey knit 17.5 µm merino, 140 g/m ² (Aclima)	86 %	88 %	83 %
24	Woven linen, natural grey (Krivi vev)	84 %	77 %	93 %
28	Polyester microfibre, white, knitted (Nike Dri-FIT)	84 %	86 %	82 %
7	Woven twill purple/black with fishbone stripes 15.75 µm merino, 250/270 g/m ² (Lindholm pure-JH Clissold)	83 %	83 %	83 %
21	Woven flannel with purple checks, merino, 275 g/m ² (Lindholm pure-Ipekis)	83 %	75 %	88 %
14	Black interlock knit, 20.5 µm merino (Aclima)	79 %	79 %	79 %
11	Green jersey knit 18.15 µm merino, 145 g/m ² (AWI)	78 %	81 %	75 %
20	Yellow Krivi wool weave with stripes (Krivi vev)	78 %	65 %	89 %
19	Striped white and grey jersey knit 17.5 µm merino, 140 g/m ² (AWI)	78 %	73 %	82 %
17	Woven grey/purple checks, <18.5 µm merino, 270 g/m ² (Lindholm pure-JH Clissold)	77 %	75 %	79 %
3	Natural white jersey knit 14.5 µm merino (AWI)	75 %	70 %	81 %
25	Red jersey knit 17.5 µm merino, 140 g/m ² (Aclima)	73 %	73 %	73 %
15	Purple Jacquard wool weave with flowers (Krivi vev)	71 %	67 %	75 %
9	Black woven <18.5 µm merino, 280/300 g/m ² (Lindholm pure-JH Clissold)	67 %	58 %	75 %
10	Woven cotton, blue with flower print (SIFO)	61 %	54 %	67 %
1	Woven merino 16.25 µm, grey (Lindholm pure-Morrgott)	56 %	71 %	43 %

12	Green thick terry knit, 65% merino (20,5 μm), 20% polyester, 15% polyamide (Aclima)	53 %	39 %	67 %
16	Woven 65% Polyester, 35% Cotton, white bed sheet material (SIFO)	48 %	43 %	53 %
5	Woven silk, red with flower print (SIFO)	47 %	40 %	53 %
18	Woolnet 80% merino (20.5 μm) 20% polyamide (Aclima)	46 %	42 %	50 %
27	Viscose, plain woven white (SIFO)	15 %	8 %	21 %
Total mean		72 %	70 %	75 %

4.3.8 Informants' evaluation methods

The informants had different ways of evaluating the samples. Most of them picked up the sample, stretched it a bit, and felt it between the fingers. Some tried a bit more advanced methods and held it either around the wrist or against the neck/chin, tried to slide fingers across it, and a few even tried smelling them. These methods were especially used when the informants were uncertain whether the samples were wool or something else. For some samples they had an immediate reaction; some informants would toss away, eg. the sample No. 28 (polyester microfibre) and act like it was disgusting, or feel sorry that they thought that the sample such as 26 VikingGold wool was not good for bedlinen or nightwear, as "it is really nice but for other use areas".

4.4 Summary of material tests

Most of the informants were positive to the merino wool samples. Sample 1 used by Lindholm pure for duvet covers and pillow cases was selected as one of the most popular for that use, and thin jersey samples from AWI and Aclima for nightwear. However, many informants were also positive to use these samples in other bed products due to their softness. Most informants preferred knitted for nightwear and woven for bedlinen, with some exceptions, those used to using knitted stretch sheets.

Most of the informants were very negative to the use of synthetic materials in the bed. They were positive to the traditionally looking white woven bedsheet sample with polyester/cotton until they heard it included polyester.

The informants that were not accustomed to modern thin merino wool products were surprised that such qualities existed. They did not recognise these as wool at the beginning of the test, but learned quickly after a couple of mistaken calls.

Based on colour evaluations, it is not a problem to use darker colours for bed sheets for the majority of informants, although a few did react negatively to black.

5 User trials

Ten informants were selected for user trials. They received bed linen and night-wear in merino wool alongside a simple report form to note how they experienced the change from a cotton-based bed to the wool-bed. The form can be found in Appendix 5.

We selected five informants from Sweden and five from Norway, and additionally aimed for variation in age and gender, as well as different experiences with next-to-skin in wool use and in sleep quality. For practical reasons some of the selected informants were couples. This enabled us to include more men in our user trials. This was also necessary as we received eight duvet covers where two were double width that therefore needed to be tested by couples that use that size of duvets. When reading the results, one must take in to account that the informants are not regular customers that have chosen a product, but they are selected to represent a variety of consumers. When we included couples in the user trials, our primary informants were more likely to be more experienced wool users than their partners who had not chosen beforehand to participate the study.

5.1 Materials

The duvet covers and pillowcases for the user trials were prototypes delivered by Lindholm pure. The production samples were made of various materials and sizes, and included six single duvet covers (one 200 cm long and five 220 cm long), two double duvet covers, and eight pillowcases. The list of bed linen with pictures can be found in Appendix 6, and materials used in them are listed in Appendix 7. One of the fabrics used in duvet cover set No. 8 was presented in the material test as sample No. 1, and the fabric from duvet cover set No. 2 was presented in the material test as sample No. 6. The participants were requested to return the bedlinen samples after the test period.

The nightwear was delivered by Aclima AS based on their existing range of thin merino underwear. The participants chose one upper and one lower body piece of underwear from the alternatives given in Appendix 8. These were sent directly to them from Aclima. The participants get to keep these clothes after the test. Lightwool materials used in these products were included in material test as samples No. 4 (light blue) and No. 25 (red).

5.2 Results

The results are given as a translated reports of the written responses that the informants sent after the use period.

5.2.1 Norwegian users

Astri (IN3)

Astri (55) tested a single bedlinen set No 2 (width 140 cm, length 200 cm) with a pillowcase and black singlet and hipster shorts for two weeks. Her overall evaluation of the products was very positive. She thought that the structure of bedlinen was a bit rougher than what she is used to. However, after two weeks of use she described it as “quite smooth, solid and thin, to be wool”. She did not think it was too rough for next-to-skin.

She uses woollen nightwear normally during autumn and winter as well, so she did not notice any difference related to that. She uses woollen nightwear normally because of its good temperature regulating properties and because it does not need to be washed that often. She sleeps in a short sleeved t-shirt and boxers.

Astri has some problems with restless sleep, and did not notice that the bedlinen made any difference. She also experiences some hot flashes during nights, but the bedlinen did not effect this; they did not get any worse or better. She slept in a cold room and the outside temperature was below zero.

Before the trial period, she was worried that the bedlinen would be too warm, but it did not actually feel any warmer than her regular bedlinen. She experienced that the surface of the bedlinen was bit rough to start with (she usually sleeps in silk bedlinen), but she got used to the feeling.

She was surprised that the bed linen did not give any increased feeling of warmth. For her, this was positive. The surface feels cool if the temperature in

the room is cool. There was less difference compared to regular cotton bedlinen than she expected.

She felt that the bedlinen material was of high quality, exclusive, and that it remains nice, does not wrinkle, and is smoother than expected. She would not have guessed that it was wool if she did not know it beforehand. She would wash woollen bedlinen more seldom than cotton bedlinen.

She has no suggestions for improvement. She could definitely think of acquiring woollen bedlinen and using it together with the woollen nightwear. She could also recommend it to others, because she thinks the material is great, it feels durable and exclusive.

Mikkel and his wife (IN2)

Mikkel (37) and his wife tested a double duvet cover (width 200 cm, length 220 cm) (Set No. 9) and one pillow cover from set No. 5. For nightwear, Mikkel chose a black singlet and boxer shorts, and his wife chose a red singlet and hipster shorts. They sent a common evaluation of the test period. Their experience was not as good as the others, and they only managed to test the products for four nights. They reported that unfortunately, the woollen bedlinen was too itchy /caused too much prickle, and that they only managed to sleep four nights in it even though neither one of them has especially sensitive skin. The experience with nightwear was better, they though it was nice and “breathed” well.

They experienced that the woollen bedlinen made it more difficult to fall asleep, but that once you fell asleep the sleep quality was ok and it did not itch anymore. Mikkel’s body temperature during the night was as normal, not too hot or cold. The temperature in the bedroom was around 10 °C and outside temperatures varied from 0 to +5 °C.

They experienced the bedlinen as negative, because it was itchy and harder than bedlinen they usually use, and would have liked it to be softer. However, they thought that the materials “breathed well” and that using them feels better and gives them a cleaner conscience.

Cecilia and her partner (KN1)

Cecilia (30) and her partner tested two single duvet covers (width 140 cm, length 220 cm) and two pillowcases (sets No. 7 and 8, where 8 includes 5% silk). For nightwear, she chose a black long-sleeved shirt and long underpants, and he chose a black singlet and black long-johns.

They wrote a common report of the trial period. They had tested different combinations of nightwear and bedlinen; both products combined for 8 nights, bedlinen alone for 3 nights, and nightwear alone for 2 nights. The total length of test period was therefore almost two weeks.

Their first impression of bedlinen was that it was different material to what they usually use, as it seemed heavier. The use experience of the bed linen was negative, and their response is centred around how much the bedlinen itched/prickled. This was worse for the pillowcase than the duvet cover, and worse when they did not wear the nightwear. They managed to sleep better with long nightwear on, as then there was less contact with the bedlinen. Cecilia's partner had tested the bed set with 5% silk in it, but he had thought it was too itchy as well. They said that it was difficult to fall asleep with the itchiness, but when they slept, they slept well. However, they had positive comments related to the temperature regulation of the bedlinen, as they thought it was more comfortable than regular bedlinen when breaking into a cold sweat, and that the bed linen was suitably warm. The temperature in the bedroom was cold, and outside temperatures varied between -2 and +3 °C.

On the other hand, the comments related to nightwear were mainly positive. They thought it was soft and nice, but could get a bit too warm. However, Cecilia said that she gets easily cold, so the warmth can also be positive.

They responded that they were mainly surprised by the fact that the bed linen had been that itchy, and would not think of acquiring it for themselves nor recommend it for others. They would consider buying the nightwear for cold winter nights and recommend it for their friends and family. Concerning the laundering, they do not think they would launder it differently from their regular bedlinen or nightwear.

5.2.2 Swedish users

Vanja and her partner (KS5)

Vanja (40) and her partner tested two single duvet covers (width 140 cm, length 220 cm) and two pillowcases (Set No. 4). For nightwear, she chose a black singlet and hipster shorts, and he chose a red/black singlet and black boxer shorts.

Vanja's partner's report was rather short. He commented «I sleep when I'm lying in bed and I don't think that much about it». They tested the combination

of woollen bedlinen and nightwear for five nights and tried the nightwear in addition for one night with their regular cotton bedlinen. He did not notice any difference when compared to use of regular cotton bedlinen, but the nightwear was a bit warmer. He had slept well, but said he did not think it had anything to do with the wool. Despite the short responses, he answers he could think of acquiring woollen bedlinen and/or nightwear, and that he could recommend it for others.

Vanja's report from the test period was much more detailed. At first, she thought that the bedlinen felt soft and nice when stroking her hand over it, but it did feel a bit prickly/itchy when she got warm or sweaty in it. It was slightly rougher/coarser than her regular cotton sheets, but she specifies that she is used to using wool and it did not really bother her that much.

She does not usually use nightwear, but the woollen nightwear was comfortable because they were tight enough and were light weight so that she almost did not feel them. Her experience of them was more positive than what she had expected, as it was more pleasant to sleep in them than anticipated. She thought they were soft and nice, and she would like to use them all through the day.

She slept well; the temperature was comfortable and she thought it might have had something to do with the woollen bedlinen. They have rather a warm bedroom and she often thinks it is too warm, but with the woollen products it functioned well for most of the time. She thinks this was actually an improvement when compared with their regular cotton bedlinen.

Vanja would wash the woollen bedlinen differently than similar products in cotton, because she sweated less in the wool sheets, and wool could be washed at lower temperatures. Concerning the nightwear, she does not usually use nightwear so washing would be additional, and she thinks she would wash it about once a week as it is so close to the body. The bedsheets she would wash more seldom.

She could imagine acquiring the woollen nightwear and use it both for sleeping and as underwear during the winter. She was a bit more uncertain about the bedlinen. She would like to have similar duvet covers but in even softer fibre, to avoid the negative feeling of slight itchiness when warm. This material felt a bit like sleeping in a suit material, even though a very nice suit material. However, it had good temperature regulation and she thought it was positive that it did not need to be washed as often. She could think of recommending the products at least to acquaintances that are environmentally conscious.

Mille (IS4)

Mille (72) tested a single duvet cover (width 140 cm, length 220 cm) and pillowcase (Set No. 3). For nightwear, she chose a red long-sleeved shirt and long underpants, but reported that she had received them in different colour than what she had asked for.

Mille tested the bedlinen for 14 nights and was quite satisfied with the duvet cover, which was smooth, fresh and looked great. However, she did not like the pillowcase that was made of the same material. She said it was too coarse, unpleasant against the cheek, and hard as sandpaper. She was happy when the test period was over and she could change back to her regular linen pillowcase. She could think of recommending the duvet cover for others and acquiring it for herself as well, but in a nicer colour (it was grey).

She used the nightwear only for 3 nights, because she realized that she slept worse because she was too warm. She usually wears a nightgown, and thinks that it is important that nightwear is spacy/airy around the body. She refers to sleep research and says that the body temperature should be lowered to 36.6 degrees when sleeping (<http://ki.se/utbildning/somn>). She turns off the heating and opens the window during nights so that the temperature is around 17°C, but the long nightwear was still too warm. She suggests that it might be more suitable for Mid-European countries that have cold inside temperatures during winter. However, she thought it was really nice as underwear, and is going to use it for that purpose. For nightwear, she prefers her regular nightgown.

Roy and his wife (IS8)

Roy (45) and his wife tested a double duvet cover (width 200 cm, length 220 cm) and one pillowcase (set No. 5). For nightwear, Roy chose a black singlet and boxer shorts, and his wife chose a black singlet and long-johns.

Both Roy and his wife were positively surprised by the products. Roy was prejudiced that they would be too warm, itchy and uncomfortable, but they had not experienced this at all during the four weeks they tested the products. He usually sleeps naked, but did not experience that the wool singlet and boxer shorts were too warm either. They had not noticed any difference related to moisture regulation compared to the cotton bedsheets they usually use. The only thing they did not like was the dark blue colour of the duvet cover. Before the project, he was not aware of that wool should be washed with a different detergent, but had now bought this for washing wool. He would consider using such products in the future as well, but said price might be a problem. However, he would

consider paying the same for two good quality products if compared to six lower quality products, and said his wife is the same; they prefer quality over quantity.

5.3 Summary of user trials

Participants were positive to the nightwear's material which they experienced as soft, thin and comfortable. Some of the respondents testing the long underwear thought it was a bit too warm, but this was also dependent on the temperature in the bedroom and what they usually wear during nights. All of the participants were positive to using the products as underwear.

Many reported that the bedlinen was itchy, however this bothered them to different extents. The coarseness was felt even more with the pillowcases than the duvet-covers. Many respondents were positive to the temperature regulating properties of duvet covers, and that the materials looked nice and held their shape. Different fabrics were used in the bedlinen samples, which makes it more difficult to draw common conclusion as the quality including fibre diameter and fabric structure may vary.

It was surprising that there was such a large difference between the informants' expectations and the use trial results. They were worried about the possibility that the bedlinen would be too warm, but this was not reported to be a problem by any of the informants. Instead, the itchiness was experienced as a problem despite that these informants thought that the same wool products in the material test could be suitable for bed linen use.

6 Conclusion

The main objective was to examine barriers to reintroducing wool as a bed textile. We also wanted to see if these barriers are similar for different ages, for sleepwear and for bedding, for Norway and Sweden, and in various use contexts. We must now answer these questions and highlight some other key findings in the material that has implications for such a transition.

The possibility of bedlinen in wool was met with positive curiosity by most informants. They were not averse to that bedding can be in wool. This is an important finding in both the interviews, the material test and testing of products. Most positive are those who already have a lot of experience with next to skin merino (underwear and toddlers' apparel). In relation to the development and marketing of bedding it is important that the products meet precisely this curiosity.

Nightwear in wool evokes less curiosity; however, several have experience sleeping in wool underwear. The transition from cotton to wool sleepwear is therefore a smaller step. In Norway, infants and toddlers' sleepwear in wool is the norm. Nightwear is also, more than we assumed, associated with children. The informants often slept naked, or in various forms of underwear. Increased use of wool as sleepwear can thus also be promoted through marketing of wool underwear's flexibility as day and night attire, and not only through separate collections for night use only.

6.1 Important barriers

The main barrier for changing to the use of wool is a general marginalization of the entire consumption field. Few had an active or conscious idea of what kind of bed linens they wanted, although some also appreciated good quality and had acquired bedlinen in linen or silk, or wanted wool. Most was bought cheaply or received as gifts. This low prioritisation of the night textiles may be

because the options are actually limited and that therefore they are not perceived as something important. But another possibility is that the consumption field is more related to social activities and the public domain which appear to be more important than the consumption behind the closed bedroom door.

An important methodological comment relative to the low priority of bedlinen is the range of informants. Our informants were relatively young and healthy. It is possible that a group with health problems would have prioritised differently. The informants had only minor sleep problems, but they still experienced that temperature was important for quality of sleep. A group with sleeping problems would also be likely to more concerned about the potential for improvement.

The next biggest barrier is the understanding of wool as warm. Granted, this is something that speaks both for and against wool in a bed, however many are afraid that wool would be too hot. To overcome this, it is essential to emphasise wool's temperature regulating properties, rather than the warming ability. Many had heard about this, but still did not completely believe this or relate it to their own wool use. For some, animal welfare is essential when choosing wool in general or merino specifically.

The understanding of hygiene has much in common with the understanding of warmth. Even here, our informants have knowledge, although they do not quite trust it. This results in more frequent washing than what had been optimal especially for those who use wool less. This indicates that the cleaning frequency would decrease with increased use of wool. Hygiene is probably a major barrier to increased use of wool underwear, especially panties/boxers. The reasons for, and remedies to overcome this, however, are probably the same. We need for better documentation of the relationship between fibre, temperature and cleanliness both understood as the absence of odour, stains and undesirable microorganisms.

Wool is associated with knitted structures and not so much with woven. This is both a challenge and an opportunity. Many are surprised that the thin woven fabrics in merino are wool. The surprise triggers curiosity, but that the material in itself is not recognised as wool can be a barrier, both in acquisition and in care/use.

While informants generally were more curious about wool bedding than nightwear in wool, the opposite tendency shows through the experiences of the 10 who tested sleeping in wool underwear and wool bedding. They were surpris-

ingly positive about the experience of sleeping in wool underwear. The bedding, however, was not perceived as soft or as comfortable against the skin as they had imagined. This is surprising because the same textiles were rated as soft enough to have next to the skin in the material-test. It was surprising that while itching was not considered a major barrier in the interviews, many were concerned the bedding would be too hot. In the use tests, however, the feedback on the temperature regulation was very positive. The bedding was not perceived as hot in any negative sense and had the expected ability to regulate temperature and humidity.

In further work on 'wool-beds' it is important to understand itching better. Why did so many of our informants feel that the underwear was soft and comfortable, while the woven bedsheets felt rough and uncomfortable on the skin? Is the selection of informants skewed? Is the experience of woven qualities more new and unfamiliar and therefore less comfortable? Was the material simply not 'soft' enough to sleep in? Should bedlinens be made in knitted qualities? These are some of the many questions this result raises.

6.2 Who could love a wool-bed?

Dedicated wool-lovers have no barriers for switching to a wool-bed. When they do not already have one, it is because there is little to be had on the market. Because there are more people who have good experiences with next-to-skin merino in Norway than in Sweden, this is probably where the barriers are the lowest. However, there are very dedicated wool-lovers in Sweden who are used to having to make a greater effort, and pay a higher price in order to obtain the products they want in wool. In Sweden, there is a bigger need for education on proper care and use than there is in Norway.

Norwegian parents are the group that use the most merino and where the wool use to the greatest extent is understood as a norm, or as 'the natural choice'. This suggests that wool bedding for infants would be an easy step for them.

There is strikingly more use of wool in beds at the cabins than at home in the urban setting. This is because of the temperature; the cabins are cold when not in use and that it takes time to warm them up (though some have a mobile app for turning on the heat ahead of time, before they arrive). Beds can thus seem clammy with cotton fabrics. But other factors also play a role. Wool belongs there (at the cabin) because it is recognised as natural, traditional and warm, because dress standards are downplayed. Cabin-owners will thus probably love

wool bedding and sleepwear, or at least a combination of day and night indoor apparel.

There is a market for people with problems sleeping and with temperature-regulating issues and/or who spend a lot of time in bed; and what exists in the way of wool bedlinen precisely targets the market of elderly and the sick (Klepp, Tobiasson & Laitala, 2015). Another interesting group who have problems with sleep and temperature are menopausal women. The advantage of this group (in Norway) is that they have a lot of experience with next-to-skin merino through toddlers and are in "mid-life" and can easily become a stable customer base over time.

Finally, we believe that the understanding of wool as a quality fibre and authentic will constitute an opportunity for quality-conscious and discerning customers. People who generally want 'the best' and do not perceive high price as a problem, but a sign that the product is desirable. For this group design, packaging and the overall product presentation will be important along with everything being in order, from animal welfare to the perfection of the seams.

6.3 The new opportunities

6.3.1 Trying out

Curiosity and the uncertainty around wool as a bed textile indicates that it is possible and a good idea to let customers try bedding. This could be developed as a type of service where it was possible to rent bedlinen for a period and then buy at a somewhat reduced price. The emergence of various forms of sharing economies would strengthen such a business model. We already have good traditions for multiple user services for pregnant women, bedlinen for menopausal women may be an option as well. The hygienic aspects of this will naturally have to be addressed, but we have already seen some sharing-model of bedding both privately (guests) and publicly (hospitals, hotels, etc.), although sharing wool bedding raises some other questions.

6.3.2 Toddlers in wet beds

Many children wet the bed even into their school years. This is children who do not sleep in cribs, but in normal size bedding. Both the fact that wool becomes warm when wet, and the low odour developments indicates that a wool bed will be a good thing for this group. Use of wool bedding will also reduce cleaning frequency, because odour problems will be substantially less.

6.3.3 Cabins

Cabin-owners have already been mentioned as a possible customer group for wool bedding and sleepwear. Cabins vary between hot and cold, which can cause moisture problems. Cabins and cabin life also has some other features that constitute opportunities for wool products. This includes ideals (and ideas) related to activities, aesthetics, materials and the relationship to nature and naturalness.

6.3.4 Mites

A desire for a bed without mites is mentioned by several, solutions however are identified as laborious. An investigation into mites in various types of fabrics would be interesting. If wool proved to have lower levels of mites, this would be a very important argument for a wool-bed.

6.3.5 Changing on the bed

Everyone likes clean bedding, however changing the bedding is tiring and time-consuming. That the bed stays clean and fresh longer will thus be an important argument for a transition to a wool-bed.

6.3.6 Environment

Consumers have not (yet) noticed that wool is considered as a bad environmental choice in the international tools for comparison of fibres' environmental impact. However, many have heard that cotton is not good for the environment, or very critical to synthetics. This suggests an opportunity in relation to changing the terms for comparison. A shift towards greater emphasis on use and lifespan will be in wool's favour. It is therefore important to emphasise knowledge about the environmental impact per night's sleep for different options with different washing frequency. What is a good thing for the environment, namely less washing frequency, is also a benefit for consumers in terms of clean beds with less effort.

6.3.7 Norway and Sweden

There are differences in wool use between Norway and Sweden. Some of them are associated with traditional garments such as sweaters, hand knitting, national costumes etc. In terms of next-to-skin merino, informants maintain that passion for outdoor winter sports is important. We think the normalisation of toddler' apparel in wool is more crucial. To understand why this change has

occurred in Norway and not in other countries in the same way, we would need to study other countries in terms of the relationship between clothing and physical activity both for infants, kindergarten children and younger school-children.

Having said this, there are still many opportunities to increase and improve the wool use in Norway. This applies e.g. to the practice of cotton panties under wool underwear. The market for good general clothing beyond sports and beyond traditional wool garments such as sweaters, jacket, gloves and hats is still small. Thin, daily attire, underwear for more than sport, indoor training etc. constitutes a small market and is not well known among consumers. Therefore it represents an opportunity.

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Appendix 1: Web survey form

1. **When/if you are buying following products, how important is it for you that they are made of Norwegian/Swedish raw materials?** (Answer in a scale from 1 to 5)

	1 Not im- portant at all	2	3	4	5 Very im- portant	Do not buy such products/ not valid
Lamb chops						
Woollen clothes						
jam						
Wool yarn						
Sheep skin						
Vegetables						

2. **When/if you are buying following products, how important is it for you that they are processed/manufactured in Norway/Sweden?** (Answer in a scale from 1 to 5)

	1 Not im- portant at all	2	3	4	5 Very im- portant	Do not buy such products/ not valid
Lamb chops						
Woollen clothes						
jam						
Wool yarn						
Sheep skin						
Vegeta- bles						

3. When do you usually wear woollen clothes? (select all that apply)

<input type="checkbox"/>	Autumn/winter
<input type="checkbox"/>	Spring/summer
<input type="checkbox"/>	Outdoors recreation and training (for example, skiing, walking, hiking and other training)
<input type="checkbox"/>	In the evening when I sit outside in the summer
<input type="checkbox"/>	When I'm at the cabin
<input type="checkbox"/>	In parties (for example woollen dresses, suits etc)
<input type="checkbox"/>	On national day, in baptisms, weddings and similar occasions (for example national costume, woollen suit)
<input type="checkbox"/>	Other, please specify _____
<input type="checkbox"/>	Don't know
<input type="checkbox"/>	Don't usually use woollen clothing

4. How often did you use woollen clothing in February this year?

<input type="checkbox"/>	Never
<input type="checkbox"/>	Seldom
<input type="checkbox"/>	Sometimes
<input type="checkbox"/>	Often
<input type="checkbox"/>	Daily
<input type="checkbox"/>	Don't know

5. How many times do you usually use these clothes before washing them?

Enter a number. If you do not use such clothing, enter 0.

Cotton t-shirt _____ times

Woollen undershirt _____ Times

Cotton sweater _____ Times

Wool sweater _____ Times

6. Do you agree with the following statements?

	Yes	No	Don't know
I wash wool more often in washing machine than by hand			
I often have problems with shrinkage of woollen garments in laundry			

	Yes	No	Don't know
If I could choose, I would prefer wool from Norwegian/Swedish sheep			
I am willing to use money in order to achieve better sleep quality			
I would have considered buying woollen bedlinen if it was available			

7. To which degree would you prefer to buy a product made of Norwegian/Swedish wool compared to one made of imported wool, if the products were otherwise similar?

- | | |
|--------------------------|----------------------------|
| <input type="checkbox"/> | 1 – To a very small extent |
| <input type="checkbox"/> | 2 |
| <input type="checkbox"/> | 3 |
| <input type="checkbox"/> | 4 |
| <input type="checkbox"/> | 5 – To a very large extent |
| <input type="checkbox"/> | Don't know |

Questions about sleep:

8. What do you usually wear when you sleep?

	Never	Seldom	Sometimes	Often	Never
Nightwear (pyjamas, nightgown)					
Short underwear (boxer shorts, singlet)					
Long underwear (long-johns, long-sleeved shirt)					
Sleep naked					

9. Have you slept in woollen nightwear during the past year? (For example woollen underwear)

- | | |
|--------------------------|----------------|
| <input type="checkbox"/> | Yes, often |
| <input type="checkbox"/> | Yes, sometimes |
| <input type="checkbox"/> | No |
| <input type="checkbox"/> | Don't know |

10. Have you slept in woollen bedlinen during the past year? (For example woollen blanket, wool sheets)

- Yes, often
 Yes, sometimes
 No
 Don't know

11. Do you have problems either in falling asleep at night or that you wake up during night?

- No
 Yes, sometimes
 Yes, often
 Don't know

Finally, some questions for the statistical analysis

12. Gender

- Female
 Male

13. Age _

14. How many people live normally in this household, when you include all adults and children (including yourself)? _

15. How many of the household members are below 15 years of age? _

16. Which of the following statements best describes your housing situation?

- I live together with my spouse/partner
 I live together with my spouse/partner and children
 I live together with my children
 I live together with my parents
 I live alone
 I live in shared housing with other adults
 Other, please specify _____

17. Approximately how big is your own personal gross annual income (before taxes and deductions)?

- Below 200.000 NOK
- 200.000 - 299.999 NOK
- 300.000-399.999 NOK
- 400.000 - 599.999 NOK
- 600.000 - 799.999 NOK
- 800.000 NOK or more
- Wish not to answer

18. Approximately how big is your household's total gross annual income (before taxes and deductions)?

- Below 200.000 NOK
- 200.000 - 399.999 NOK
- 400.000 - 599.999 NOK
- 600.000 - 799.999 NOK
- 800.000 - 999.999 NOK
- 1.000.000 - 1.199.000 NOK
- 1.200.000 – 1.399.000 NOK
- 1.400.000 NOK or more
- Wish not to answer

19. What is your main source of livelihood?

- Employed full time
- Employed part-time
- Self-employed
- Retired / Social Security
- Currently unemployed / labour insurance
- Pupil or student
- Homemaker
- Other

20. What is your highest completed education?

- Primary education
- Secondary or vocational education (general education, vocational education and training or otherwise)
- University / college education up to 4 years duration
- University / college education more than 4 years' duration
- Other

21. In which county do you live in?**Norwegian alternatives**

- | | |
|--------------------------|------------|
| <input type="checkbox"/> | Østfold |
| <input type="checkbox"/> | Akershus |
| <input type="checkbox"/> | Oslo |
| <input type="checkbox"/> | Hedmark |
| <input type="checkbox"/> | Oppland |
| <input type="checkbox"/> | Buskerud |
| <input type="checkbox"/> | Vestfold |
| <input type="checkbox"/> | Telemark |
| <input type="checkbox"/> | Aust-Agder |
| <input type="checkbox"/> | Vest-Agder |

- | | |
|--------------------------|----------------------|
| <input type="checkbox"/> | Rogaland |
| <input type="checkbox"/> | Hordaland |
| <input type="checkbox"/> | Sogn og Fjordane |
| <input type="checkbox"/> | Møre og Romsdal |
| <input type="checkbox"/> | Sør-Trøndelag |
| <input type="checkbox"/> | Nord-Trøndelag |
| <input type="checkbox"/> | Nordland |
| <input type="checkbox"/> | Troms |
| <input type="checkbox"/> | Finnmark |
| <input type="checkbox"/> | Don't live in Norway |

Swedish alternatives:

- | | |
|--------------------------|------------------|
| <input type="checkbox"/> | Blekinge län |
| <input type="checkbox"/> | Dalarnas län |
| <input type="checkbox"/> | Gotlands län |
| <input type="checkbox"/> | Gävleborgs län |
| <input type="checkbox"/> | Hallands län |
| <input type="checkbox"/> | Jämtlands län |
| <input type="checkbox"/> | Jönköpings län |
| <input type="checkbox"/> | Kalmar län |
| <input type="checkbox"/> | Kronobergs län |
| <input type="checkbox"/> | Norrbottnens län |
| <input type="checkbox"/> | Skåne län |

- | | |
|--------------------------|----------------------|
| <input type="checkbox"/> | Stockholms län |
| <input type="checkbox"/> | Södermanlands län |
| <input type="checkbox"/> | Uppsala län |
| <input type="checkbox"/> | Värmlands län |
| <input type="checkbox"/> | Västerbottens län |
| <input type="checkbox"/> | Västernorrlands län |
| <input type="checkbox"/> | Västmanlands län |
| <input type="checkbox"/> | Västra Götalands län |
| <input type="checkbox"/> | Örebro län |
| <input type="checkbox"/> | Östergötlands län |
| <input type="checkbox"/> | Don't live in Sweden |

If you could think of being interviewed about these topics, please give your contact information at the next page.

Appendix 2: Interview guide

Use of wool

Tell us about your relationship with wool and what kind of woollen clothes you wear?

Has there been a change in it?

Is this different from other people you know?

When and how do you use wool?

What types of wool do you know? (merino, cashmere, lambs' wool, etc.)

Which of these do you have?

Which clothes **MUST** be wool?

Are there things that cannot be made of wool and if so, why?

What do you think are the advantages of using wool?

Is there something that is problematic with use of wool? ie. itchy, allergen, too hot, hard to care for...

What would help to change this?

Show some products from Aclima and ask. Do you know that such products exist, do you have something similar, would you be able to use it, how and when? Why and why not? (Bra and knickers/ boxer shorts)

How many items do you have of the following garments in wool?

- Short underpants
- Long underpants
- Singlet
- T-shirt
- Long sleeved shirts
- Nightwear / pyjamas

How and how often do you wash these garments?

Households

Children? What have you thought about them using wool?

Babies, toddlers, schoolchildren, teenagers

Has there been a difference in the use of wool at daytime and at night?

Sleep and bed

Describe your bed materials, fill etc.

Duvet and fill?

What kind of cleaning and airing procedures you have?

What are the pros and cons of your current bedding?

Do you sleep well? If not - why?

How many hours do you sleep (about?) And how many hours in bed?

Is the bed used also for other things than sleeping, e.g. reading, resting, watching TV, eating, etc.?

Is the bedroom used during daytime?

What is the bedroom temperature at night and at day?

Does it happen that you wake up of being too cold? Or too hot? Or sweating?

Do you sleep alone? If not, who do you share your bed with? (partner, children, pets?)

Bed linen (sheets)

Materials (fibre), structure (knitted, woven, flannel), colour, pattern?

What would be the 'dream bed', describe.

What is 'hopeless' to sleep in?

Sleepwear

Do you always wear clothes at night?

What kind of clothes?

What kind of sleepwear do you prefer?

Material (fibre) structure (knitted, woven) colour, pattern

Have you or has this preference changed?

Do you use nightwear during daytime or evenings (not only in bed)?

Do you wear underwear or other clothing at night?

Is this different when you are at the cabin? Or visiting others? On traveling?

When at shared public cabins (e.g. Norwegian Trekking Association)?

Do you use other clothes at night when you are sick?

Wool-bed

Do you have something made of wool in your bed today?

Have you slept in wool before?

Woollen blanket? How is it used; when and why? Above or below the duvet?
In addition to something, or instead of what?

At the cabin?

What materials are your bed linens made of? Why?

Have you heard of bed linen made of wool?

How do you think it will be to sleep in bed linen made of wool?

Have you slept in woollen clothes (e.g. underwear) before?

When and why? Pros and cons?

And what about small children ...

Markets

When did you buy a bed linen set the last time? What did it cost?

How old is the oldest bed linen that you still use?

What would you be willing to pay for a bed linen set assuming it was something you really wanted?

What would it look like?

Did you know that there are duvets with wool filling on the market? Bed linen? Nightwear?

Local wool

Do you have clothes made of wool that are produced locally?

Made of local raw materials? (Wool from Norwegian or Swedish sheep)

Locally produced (of imported raw materials)?

Do you prefer Norwegian/Swedish firms over others even though they produce elsewhere?

Examples (for products of wool)?

And why?

Do you have clothes that are specific to the area where you live? What are they? Are they made of wool?

Such as: Knitted sweaters, folk costumes, etc.

Do you knit?

Do you sew?

When did you repair a garment the last time?

Can you darn a hole in a sock?

Norway/Sweden

Do you think the Norwegians and Swedes are different when it comes to the use of wool?

Do you have any examples?

And what could be the reason?

Do you think this will change?

Do you have something made of wool from the other country?

Is your use of wool 'normal' for a Norwegian/Swede?

Personal data

Do you have more or less knowledge and interest for textiles than what is usual?

Education and work experience etc. related to textiles?

Appendix 3: List of materials in the material test

No	Name	From	Fibre fineness (μm)	Fibre content	Fabric structure	Square weight (g/m^2)	Colour	Pattern/print
1	98210/10/90 (used in bed set 8 on one side, material L6)	Lindholm Pure-Marzotto	16.25 (super 150's)	100% vw	woven		Light grey	No, but "in-grain"
2	Art. 420630 Pantone 19-0303 TPX	Aclima	Same as Warm Wool 20.5?	100% wool	1-1 wool rib	190	Jet black	No
3	1 Gostwyk Undyed 11.8 Tex, gauge 28	AWI	14.5	100% merino wool	Jersey	- (Light)	Natural white (undyed)	No
4	Lightwool 16-4127 TPX	Aclima	(17,5)	(100% merino)	Single jersey	(140)	Heritage blue (light blue)	No
5	silk	SIFO		100% Silk	woven		red	Yes, flowers
6	76400/ 60/5000 (same as material L2, just a lot darker colour)	Lindholm Pure - Marzotto	<18.5 (extrafine)	100% vw	Woven, "natural stretch"	230 gr	Dark grey	No

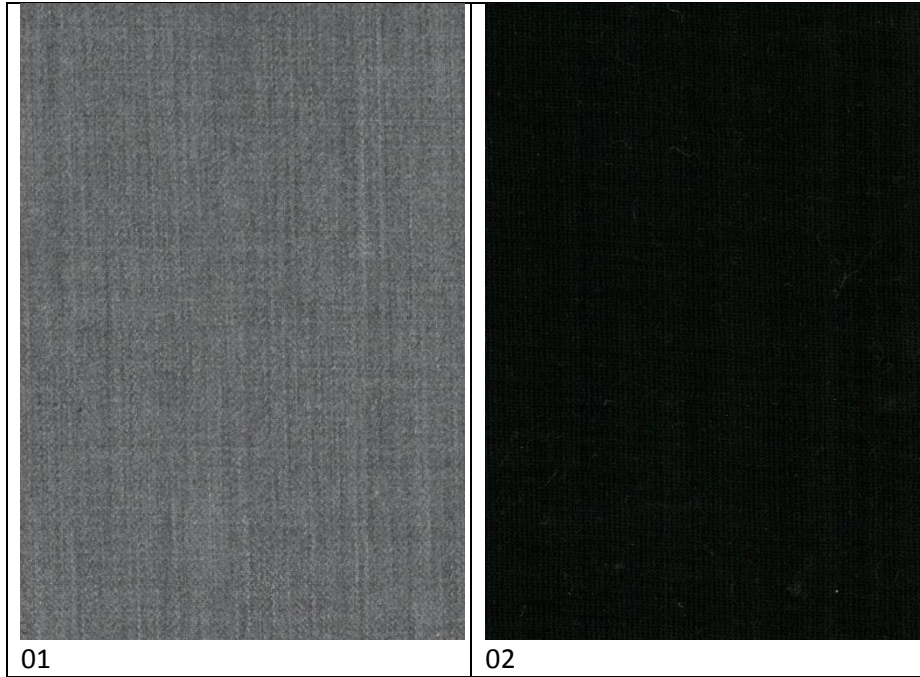
No	Name	From	Fibre fineness (µm)	Fibre content	Fabric structure	Square weight (g/m ²)	Colour	Pattern/print
7	RL 5554 145991/314	Lindholm Pure-JH Clis-sold & Son	15.75 (super 160's wool)	100% wool	Woven	250/27 0 grams	Purple/black	Yes, twill fish- bone stripes
8	4 Pale Blue* 20 tex, gauge 28	AWI	17.5	100% merino wool	Jersey	160	Light blue	No
9	NC 3941 126421/11 Finesse	Lindholm Pure-JH Clis-sold & Son	<18.5 (extra- fine)	100% merino wool	Woven	280/30 0 grams	Black	Yes, shiny stripes
10	Cotton	SIFO		100% Cotton	woven		Blue	Yes flow- ers
11	2 Green Tube Scarf 19.7 tex	AWI	18.1	100% merino wool	Jersey	145	Lime green	No
12	Hot wool Art. 536426	Aclima	(20,5)	65% merino, 20% polyes- ter, 15% polyam- ide	Terry (ullfrottè)	(230)	Olive green	No
13	NC 5481 /143675/22 Florence	Lindholm Pure-JH Clis-sold & Son	15.75 (super 160's wool)	100% wool	Woven	290/31 0 grams	Grey with pink stripes	Yes, stripes
14	Warm wool 19-0303 TPX	Aclima	(20,5)	100% merino	Interlock	235 (200)	Jet black	No

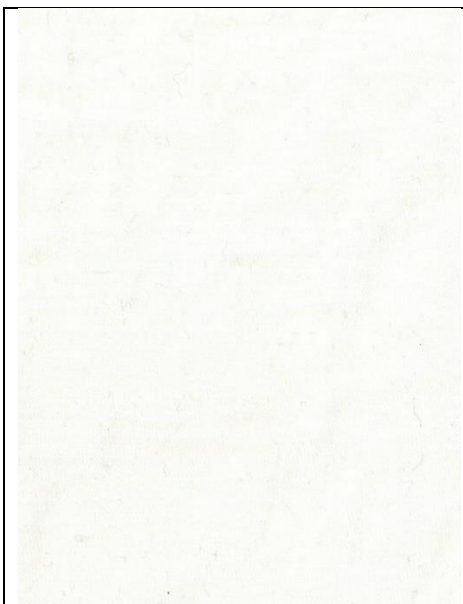
No	Name	From	Fibre fineness (μm)	Fibre content	Fabric structure	Square weight (g/m^2)	Colour	Pattern/print
15		Krivi vev		wool	Woven, Damask/Jacquard		Dark purple	Yes, flowers
16	Bed sheet material	SIFO 95/950-08		Polyester 65% Cotton 35%	woven		White	no
17	RL 1399 141187/33 Sterling	Lindholm Pure-JH Clis-sold & Son	<18.5 (extra-fine)	100% merino wool	Woven	270 grams	Grey/purple checks	Yes, checks
18	Woolnet	Aclima	(20,5)	80% wool, 20% polyamide	Net, knitted	122 (120)	Black-berry wine	No
19	3 Grey Wide Stripe* 20 tex, gauge 28	AWI	17.5	100% merino wool	Jersey	140	Grey-white stripes	Yes stripes
20	Type/kval 11/104	Krivi vev		100% wool	Woven		Yellow/honey	Yes, stripes
21	Planet-D. Code 2010 21 Variant 104 **	Lindholm Pure - Ipekis		100% wool	Flannel	275 gr/mt	Purple cheks	Yes, checks
22	(Warm-Wool)	Aclima	(20,5)	100% merino wool	Interlock	238 (200)	Natural white	No
23	5 Grey* 20 tex, gauge 28	AWI	17.5	100% merino wool	Jersey	175	Light grey	No
24	Linen	Krivi TT15		100% Linen	woven		nature	no
25	Lightwool 19-1860 TPX	Aclima	(17,5)	(100% merino)	Single jersey	(140)	Persian red	No

No	Name	From	Fibre fineness (µm)	Fibre content	Fabric structure	Square weight (g/m²)	Colour	Pattern/print
26	Norwegian wool	VikinGold		100% wool	woven		nature	no
27	Viscose, plain	SIFO		100% viscose	woven		white	no
28	Nike Dri-FIT	SIFO-Nike		100% polyester microfibre	knitted		white	No

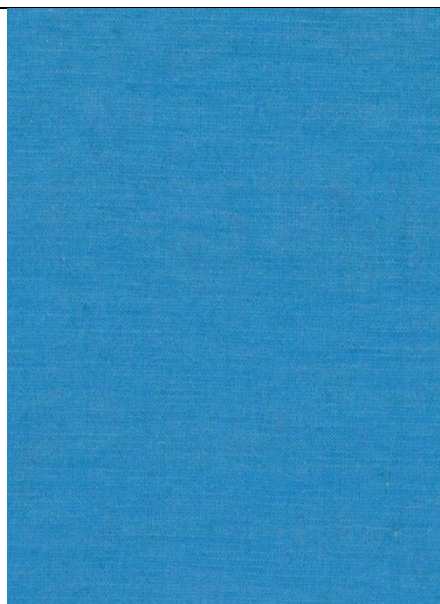
*)- Mercerised merino, 28gg, 17.5u, Spinner: Xinao, Knitter/Finisher: Doximex

Appendix 4: Photos of material test samples

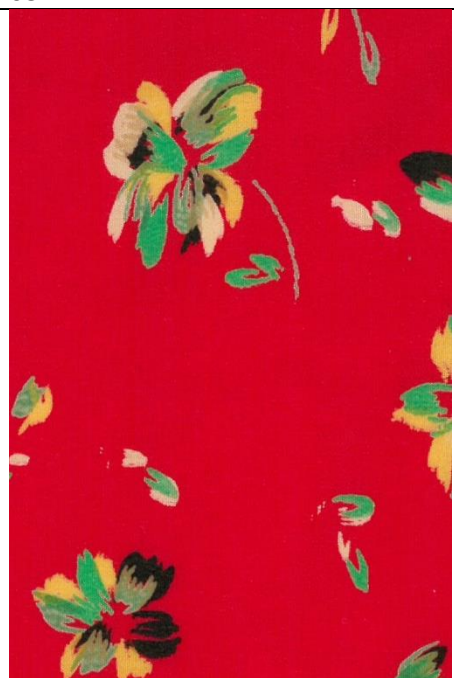




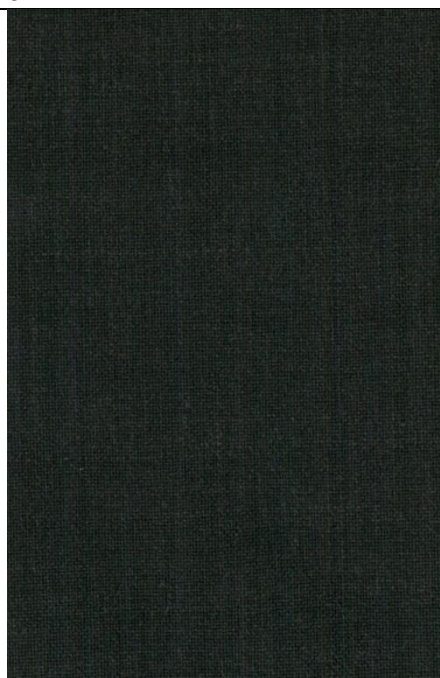
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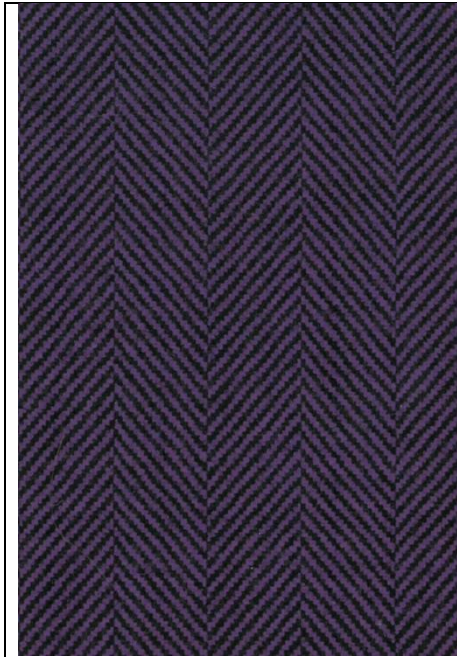
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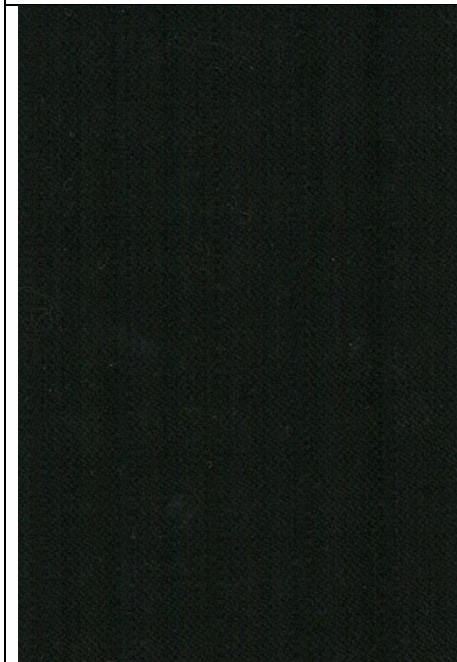
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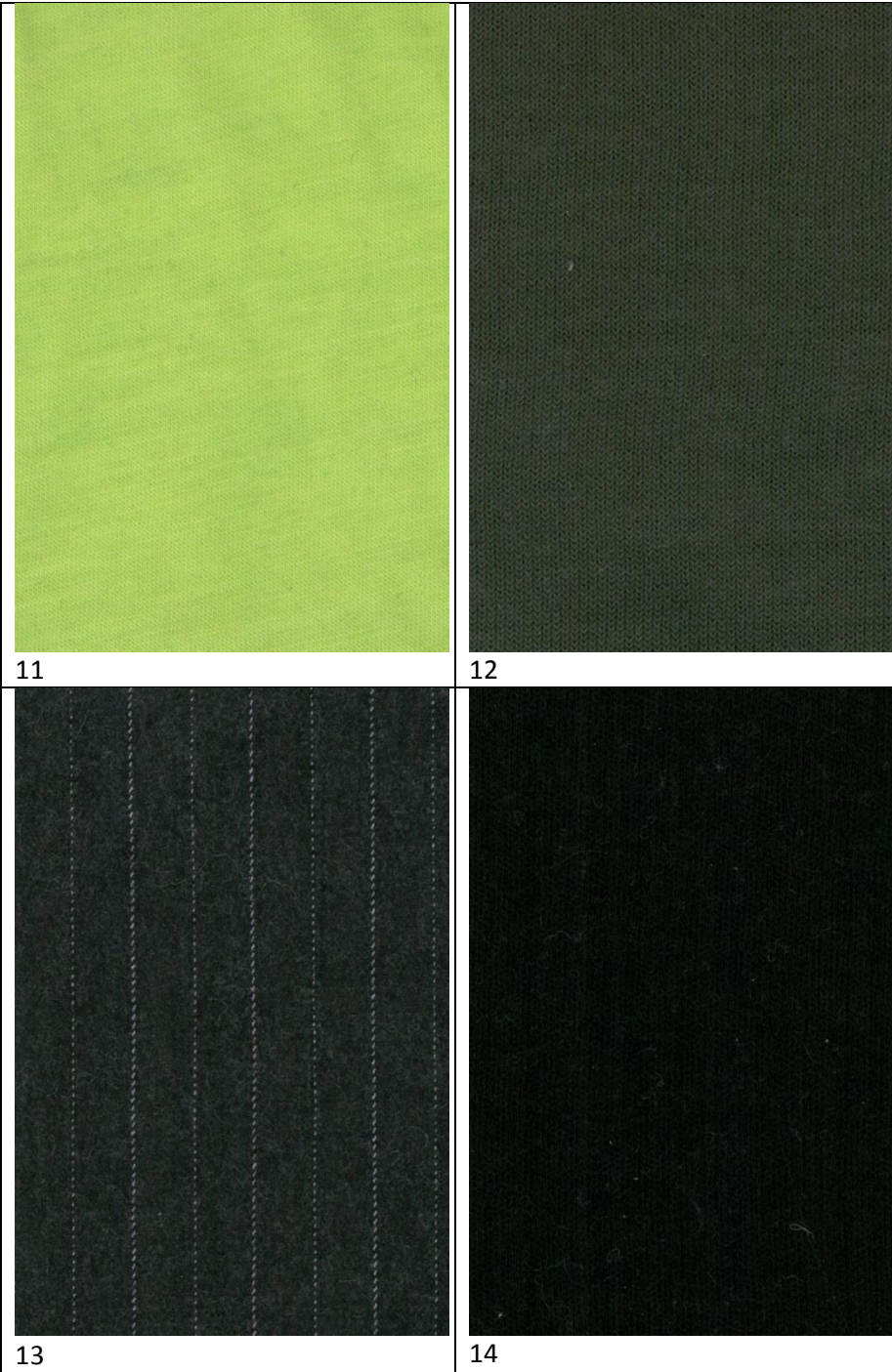
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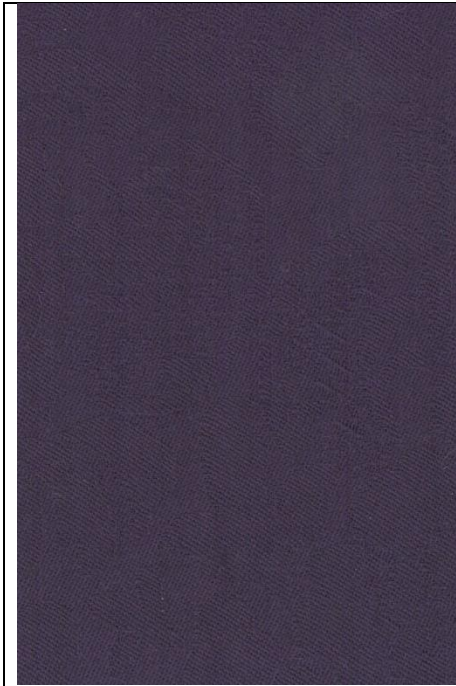


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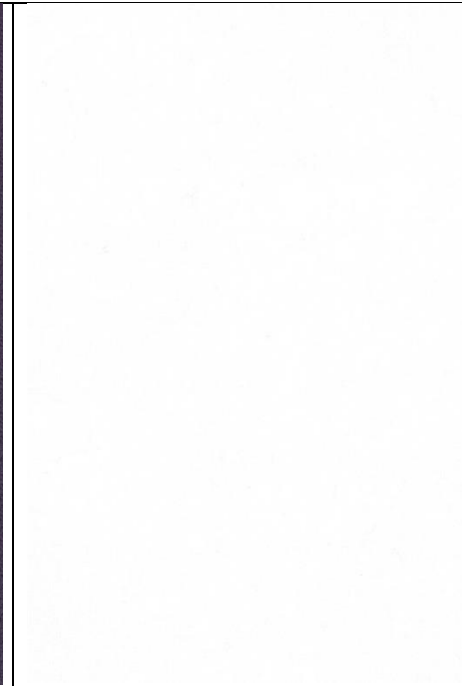


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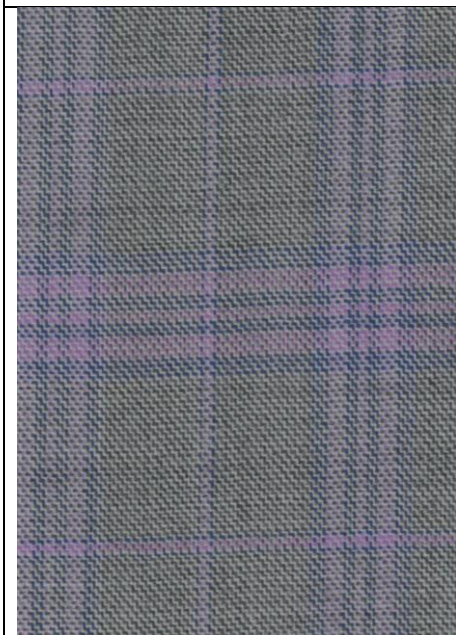




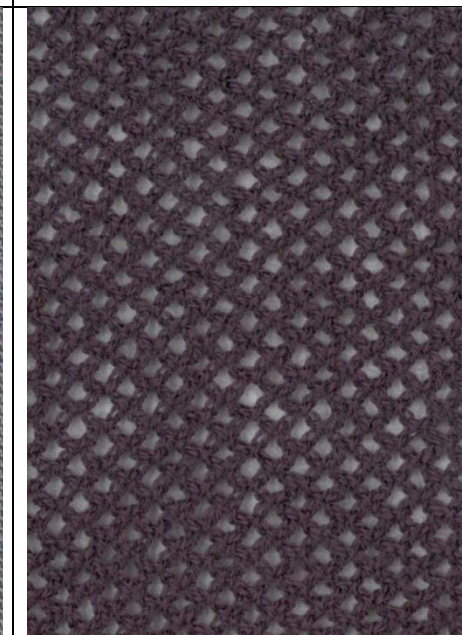
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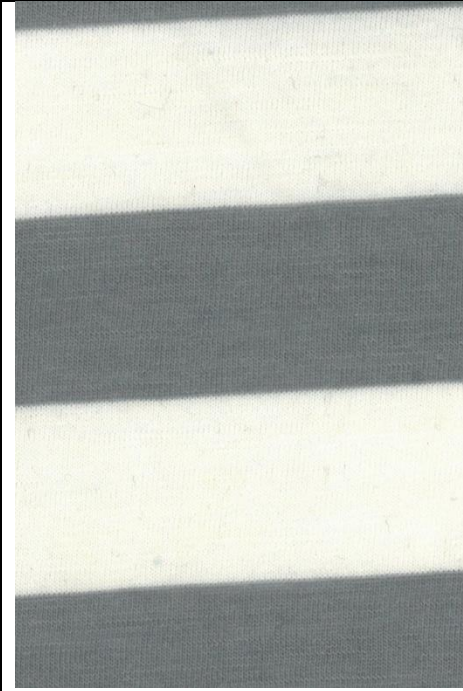
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17



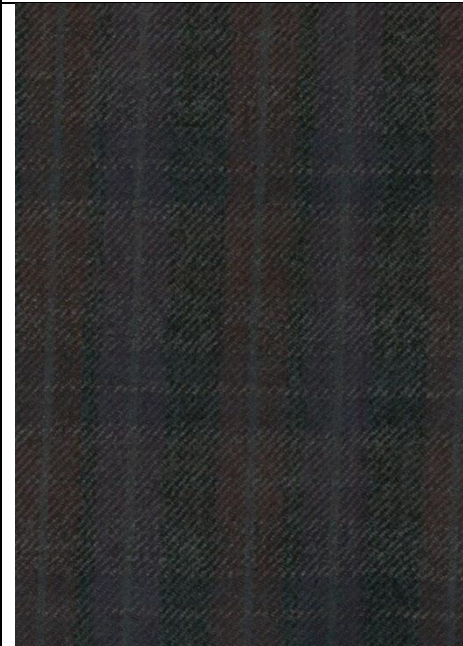
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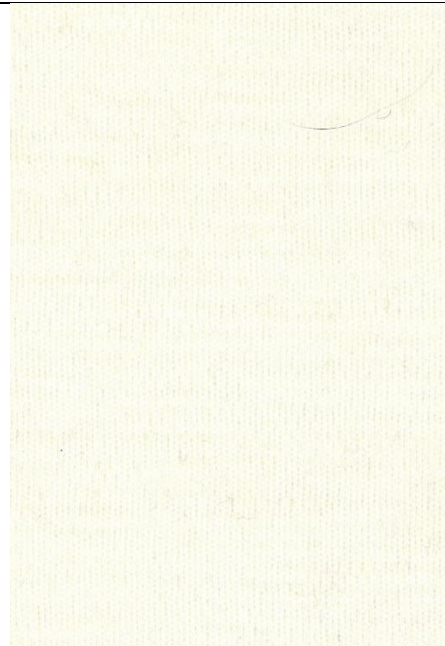
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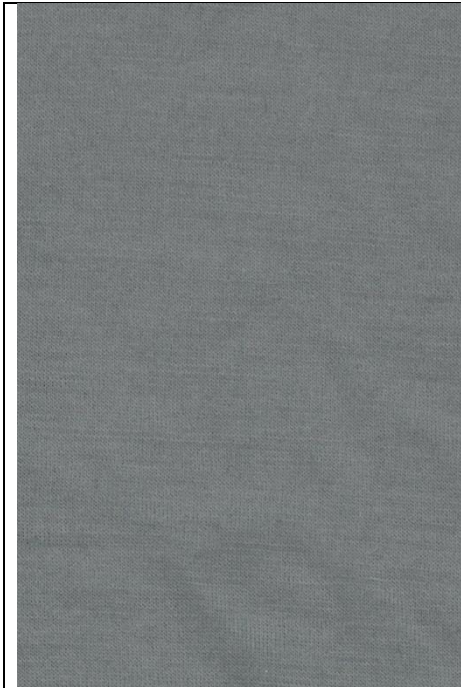
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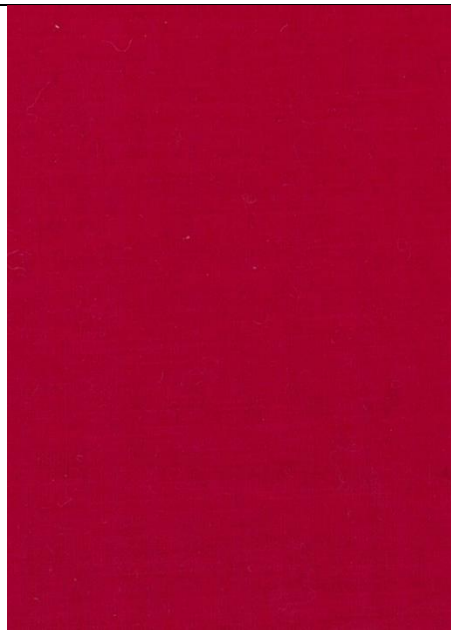
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23



24



25



26



Appendix 5: User trial response forms

User trial – first response (to be completed after 1-4 nights use)

How many nights have you tested the products? _____ Date: _____

Which combinations have you tested?

- Woollen nightwear and the bedlinen I usually use
- Woollen bedlinen and the nightwear I usually use
- Both woollen nightwear and bedlinen

Was something different from when you sleep in your own *bedlinen*?

Was something different from when you sleep in your own nightwear?

Did you sleep well? Did this have something to do with the woollen textiles? Please describe in detail.

What was positive/advantages?

What was negative or difficult?

What could have been better?

How was your temperature when you slept? And how was the temperature in the room and outside?

Do you have some other comments?

User trial – second response (to be completed after a couple of weeks of use)

Date: _____

How many nights have you tested the different combinations?

Woollen nightwear and the bedlinen you usually use	<input type="text"/>	Nights
Woollen bedlinen and the nightwear you usually use	<input type="text"/>	Nights
Both woollen nightwear and bedlinen.	<input type="text"/>	Nights

How did you experience the different woollen textiles? Please describe in detail.

1) Bedlinen:

2) Nightwear:

Was it different to what you thought it would be?

What was positive/advantages?

What was negative or difficult?

Should something be different in the products?

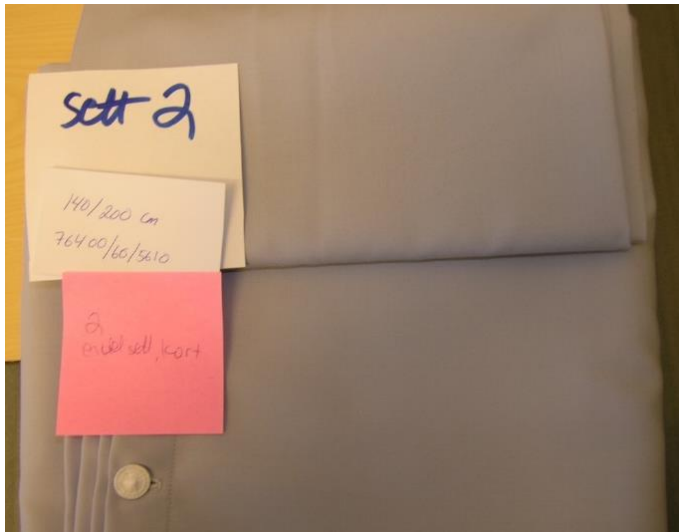
Could you think of buying or wishing to receive the woollen night-wear or bedlinen? In that case, how would you use them?

Or to buy or recommend them to someone else? Who and why?

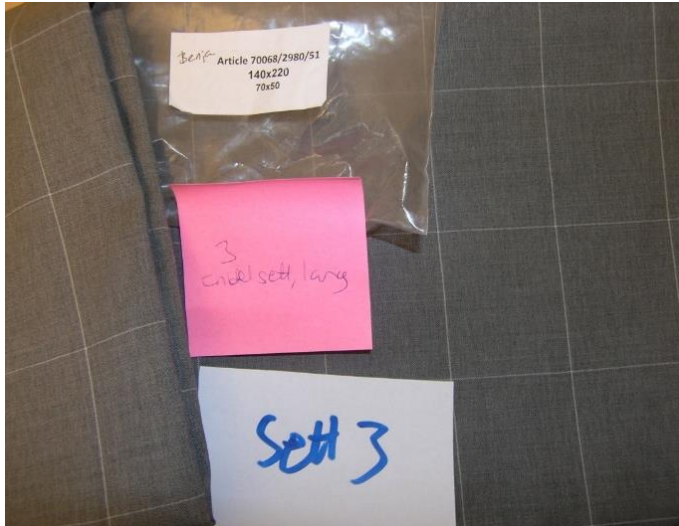
Would the use of wool effect on how often you washed the bedlinen and the nightwear?

Do you have any other comments?

Appendix 6: Photos of bedlinen sets in user trials



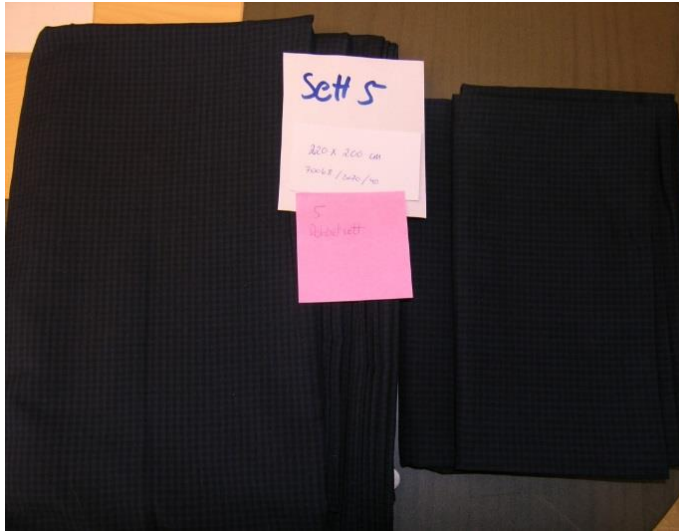
Set No. 2, fabric L2. Short single duvet cover 140 x 200 cm & pillowcase.
Tested by **Astri**.



Set No.3, fabric L3. Long single duvet cover 140 x 220 cm & pillowcase.
Tested by **Mille**.



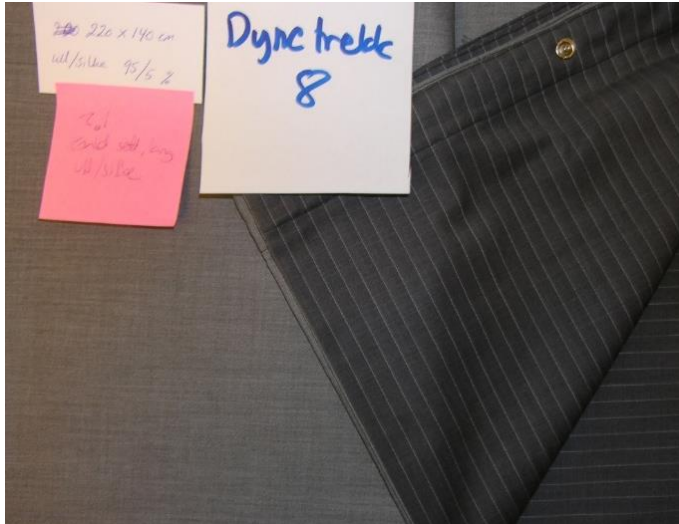
Set No. 4, fabric L1. Two long single duvet covers 140 x 220 cm and two pillowcases.
Tested by **Vanja and her spouse**.



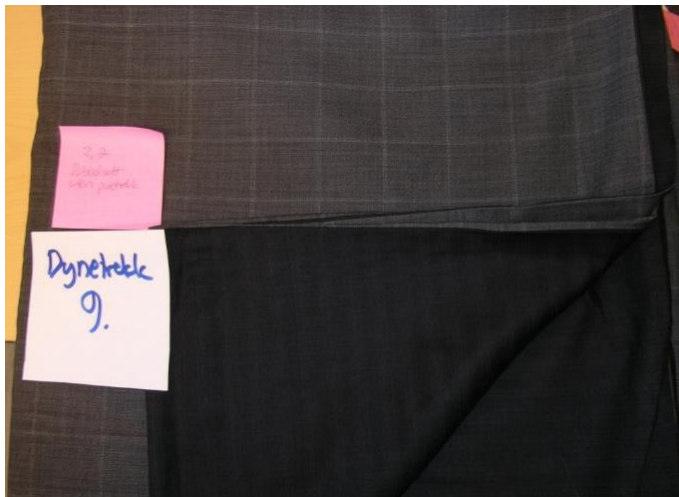
Set No. 5, fabric L1. Double Duvet cover 200 x 220 cm & two pillowcases. Tested by **Roy and his spouse**. (They only got one pillow case as Mikkel needed one for set 9)



Set No. 7, fabrics L4 in duvet cover and L1 in pillowcase. Long single duvet cover 140 x 220 cm and one pillowcase. Tested by **Cecilia**.


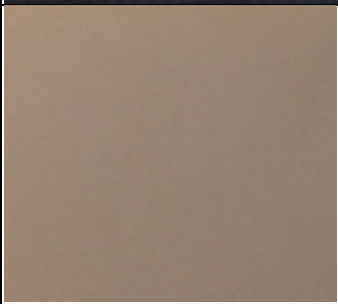






Set no.8, fabrics L5 (lines) and L6 (grey). Long single duvet cover 140 x 220 cm and one pillowcase. 95% wool, 5% silk.
Tested by **Cecilia's spouse**.





Set No. 9, fabrics L7 (grey with checks) and L8 (dark with lines) on different sides of the double duvet cover 200 x 220 cm, no pillowcase.
Tested by **Mikkel and his spouse**. They got one pillowcase from set 5.

Appendix 7: List of fabrics used in bedlinen sets

Fabric No.	Photo	Colour	Used in duvet cover No.	Used in pillow case No.	Article No.	Material test
L1		Blue-black with checks	4, 5	4, 5, 7	70068/ 3070/40	Only tiny, glued sample found, not included in the material test.
L2		Light grey, even colour.	2	2	76400/ 60/5610 GR/ALT 230/150 100% VW extrafine	Material sample in same quality but darker grey found. 76400/60/5000 Material test sample No. 6

Fabric No.	Photo	Colour	Used in duvet cover No.	Used in pillow case No.	Article No.	Material test
L3		Mellom grå, rutete (store ruter)	3	3	70068/ 2980/ 51	Only tiny, glued sample found, not included in the material test.
L4		Grey, bit uneven «ingrain» colour	7	-	80020/ 555/ 8390	No sample found, not included in material test.
L5		Grey with light stripes	8 (on one side)	8 (on one side)		No sample found, not included in material test.
L6		Grey, bit uneven «ingrain» colour	8 (on one side)	8 (on one side)	98210/10/90 100%vw super 150's	Cut fabric sample was delivered, and material sample in bit darker grey was found. Material test sample No. 1

Fabric No.	Photo	Colour	Used in duvet cover No.	Used in pillow case No.	Article No.	Material test
L7		Grey with wide checks	9 (on one side)	-		No sample found, not included in material test.
L8		Dark grey with stripes in pink and light blue.	9 (on one side)	-		No sample found, not included in material test.

Appendix 8: Nightwear alternatives from Aclima AS

LIGHTWOOL
140G SOFT MERINO WOOL

WOMAN



Art nr	Uka/Week	XS	S	M	L	XL	XXL
12701080	/ /	/ /	/ /	/ /	/ /	/ /	/ /
12701001	Uka/Week	XS	S	M	L	XL	XXL
12701056	Uka/Week	XS	S	M	L	XL	XXL
12701059	Uka/Week	XS	S	M	L	XL	XXL
12701060	Uka/Week	XS	S	M	L	XL	XXL



Art nr	Uka/Week	XS	S	M	L	XL	XXL
12110101	/ /	/ /	/ /	/ /	/ /	/ /	/ /
121101057	Uka/Week	XS	S	M	L	XL	XXL
121101059	Uka/Week	XS	S	M	L	XL	XXL



LW HIPSTER
 Weight: 63g
 Size: XS-XXL
 Color: Jet Black, Raspberry

WOMEN'S COLLECTION

COLORS	Art nr:	Uka/Week	XS	S	M	L	XL	XXL
	■	122011001	/	/	/	/	/	/
■	Uka/Week	XS	S	M	L	XL	XXL	
	122011037	/	/	/	/	/	/	/



LW LONGS
 Weight: 132g
 Size: XS-XXL
 Color: Jet Black

COLORS	Art nr:	Uka/Week	XS	S	M	L	XL	XXL
	■	124001001	/	/	/	/	/	/

LIGHTWOOL
140G SOFT MERINO WOOL

MAN



SINGLET
Weight: 95g
Size: XS-XXL
Color: Jet Black/Polinelano, Persian Red/Jet Black

Art nr.	Uka/Week	XS	S	M	L	XL	XXL
127012093	/	/	/	/	/	/	/
127012062	/	/	/	/	/	/	/



CREW NECK
Weight: 178g
Size: XS-XXL
Color: Jet Black, Dazzling Blue

Art nr.	Uka/Week	XS	S	M	L	XL	XXL
121102001	/	/	/	/	/	/	/
121102036	/	/	/	/	/	/	/



Jet Black

Dazzling Blue

Deep Grass Green

LW SHORTS

Weight: 69g
 Size: XS-XXL
 Color: Jet Black, Dazzling Blue, Deep Grass Green

Art nr:	Uko/Week	XS	S	M	L	XL	XXL
122002001	/	/	/	/	/	/	/
	Uko/Week	XS	S	M	L	XL	XXL
122002096	/	/	/	/	/	/	/
	Uko/Week	XS	S	M	L	XL	XXL
122002056	/	/	/	/	/	/	/



Jet Black

LW LONGS

Weight: 132g
 Size: XS-XXL
 Color: Jet Black

Art nr:	Uko/Week	XS	S	M	L	XL	XXL
124002001	/	/	/	/	/	/	/

Consumption Research Norway SIFO at Oslo and Akershus University College of Applied Sciences (HiOA) has a special responsibility to contribute to the knowledge base for consumer policy in Norway and will develop new knowledge about consumption, consumer policy and consumer position and role in society.

Key research topics are:

- consumers in the market and consumer choice
- household resource allocations
- consumer economy - debt development and poverty
- technological development and consumers' every day life
- digital daily life and coping
- environmental effects of different types of consumption
- food and eating habits
- textiles - value chains - consequences for everyday life and environment
- consumption significance for social inclusion
- consumer policy

The logo for SIFO, consisting of the letters 'SIFO' in a bold, blue, sans-serif font. The letter 'O' is stylized with a white diagonal slash through it.

Consumption Research Norway

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