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Recent advances in marketing and product development of Mohair and Cashmere

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INTRODUCTION

Mohair and Cashmere along with other luxury fibres such as alpaca, angora, camel and silk are rare raw materials used for higher value adding by the textile industry. These fibres are regarded by the wool textile industry as luxury and speciality hair fibres. They increase the range of processing capabilities of the wool textile industry and are commonly blended with wool. The interest in mohair and cashmere production amongst farmers, animal scientists and agricultural development agencies is that mohair and cashmere often receive high prices relative to other animal fibres. In addition goat farming offers other social, environmental and economic benefits. With the tendency for many agricultural products to be regarded as commodities, the associated strong downward pressures on prices paid for these commodities has led to a search for higher valued niche agricultural products. Currently the apparel wool market is 1.3 million t, representing 3.3% of the textile market. Speciality animal fibres represent 38,000 t or 0.1% of the textile market. Goat fibres contribute 23,000 t or 0.06% of the market. The sheep apparel wool industry is 33 times greater than the luxury fibre industry. This evidence sustains the argument that mohair and cashmere are niche markets.

To understand the recent developments in the textile use of mohair and cashmere this paper briefly discusses the general changes in the wool textile industry and in mohair and cashmere marketing and processing. The paper also briefly reviews the properties of and market threats to luxury fibres, before summarising the release of new products and potentially useful new processing onto the market since 1998.

CHARACTERISTICS OF LUXURY AND SPECIALITY FIBRES

Luxury fibres are regarded as being softer and more comfortable than other apparel fibres. Some are sought for their lustre. Luxury fibres are regarded as being more elegant and exclusive than other textile fibres. Luxury fibres are often produced in exotic regions with a romantic history. The fibres are rare and finished textiles can be very expensive (Watkins and Buxton 1992). That these characteristics can be exploited in the market place is clearly illustrated by current advertisements in wool trade journals (Anon 1997d, 1998x). Luxury fibres often need special processing equipment or treatment and so some textile manufacturers specialise in their processing. Such special processing equipment includes machinery to remove the coarse guard hairs from cashmere (dehairing) and special treatment during fibre scouring, spinning and finishing. For example Monforte, who specialise in Mongolian cashmere, also processes camel hair and yak (Anon 1999a).

PRICE AND MARKETING ISSUES

Evidence of the premium prices for luxury fibres relative to wool is given in Figure 1. This data is based on 1998 UK price quotations for processed fibre ready for either blending with other fibres or for spinning into yarn. Figure 1 shows that, even during a period of depressed cashmere prices, dehaired cashmere has consistently been valued at 6 to 8 times that of fine wool tops, with the premium dehaired 38 mm white Chinese cashmere, suitable for hosiery knitwear, ranging from 8 to 10 times the price of fine wool tops. After calculating the mean price for 1998 the following relative values of various speciality fibres, compared to 38 mm white Chinese dehaired cashmere (dhcm), were determined: 38 mm brown Chinese dhcm, 85%; 32 mm white Chinese dhcm, 79%; light grey Mongolian dhcm, 75%; 32 mm brown Chinese dhcm 72%; White Iranian/Afghan dhcm, 71%; brown Mongolian dhcm, 67%; baby camel and fine yak dehaired, 34%; adult camel and coarse yak dehaired, 26% (Anon 1998w). It is worth noting that wool is regarded as being expensive compared to other textile fibres such as cotton, polyester, acrylic and viscose as shown by this quote, "Wool is expensive so it needs to justify the high value-added components by being associated with distinctive, appealing products, particularly for younger age groups" (Anon 1995a). However prices of man made fibres are sensitive to petrochemical prices and recent upward trends in crude oil prices are a good sign for natural fibre producers.

![Figure 1: Ratio of 1998 Bradford (UK) dehaired cashmere prices relative to 19 mm, 66 mm wool top quotations (Anon 1998w)](image)

Symbols: Circle, Chinese white, open = hosiery 38 mm, closed = weaving 32 mm; Triangle, Chinese brown, open = hosiery 38 mm, closed = weaving 32 mm; Square, Mongolian, open = brown, closed = light grey; Diamond, Iran/Afghan white

Wool

Commodity prices follow price cycles. Apparel wool prices increased in the late 1980’s. Increased production followed by price resistance by purchasers then followed and led the Australian wool industry to stockpile wool from 1992. Very depressed wool prices have existed for the past 8 years. While the stockpile has declined, wool production has now declined to a 50 year low. There has been significant debate in Australia, where 70% of the worlds apparel wool is grown, regarding the development of a more efficient marketing pipeline between producers and manufacturers, with associated cost reductions and hopefully increased returns to wool growers. There has also been debate about the role of textile designers and fashion houses in the use or exclusion of wool in forthcoming new products (Moylan 1991). Some Australian wool growers decided not to sell raw wool but rather process the wool and sell textiles directly to consumers. This has led to some successes such as Merino Gold (16.5 to 19 µm knitwear) and Willaba but also to some failures. Surveys of consumers
in the big 6 wool markets indicated that the most important negative attribute about wool clothing was prickle discomfort. New product development in the wool industry focuses on comfort, softness, lightness in weight, ease of care, retention of appearance and colour (IWS 1993). Growth markets are in the smart casual, semi formal, young casual and trans-seasonal markets. One important message for woolgrowers has been the need to produce finer wool.

MOHAIR
From 1988 the International Mohair Association (IMA) implemented a strategy of generic promotion of mohair and promotion of the Mohair TradeMark as a sign of guaranteed quality. However after millions were spent on promotion the effect on the sales of mohair were insignificant according to the General Manager of the then South African Mohair Board, (Van der Westhuysen 1992). He stated that the primary product price represented between 2 and 5% of the value of the end product. Given that mohair represented less than 0.005% of the value of all textile end products it can hardly be expected that promotion would be a determining force dictating fashion changes. It is the fashion trend that dictates the demand, a view reinforced by Weatherall (1999), a prominent European buyer of mohair. «The basics are that mohair is a fashion fibre and fashion is what creates demand for mohair». It is therefore a waste of money to promote a fashion when it is out of fashion. While the development of new products is essential any new product will not be able to overcome the large fashion cycle for the 80% of the mohair clip subject to fashion cycles van der Westhuysen (1992) concluded. These views are not going to inspire confidence in mohair producers brought to the point of bankruptcy only 2 years ago by dismal prices.

The South African mohair industry has since embarked on a promotion of the special qualities of «Cape Mohair», including the use of their own trade mark, which is hoped will make a difference to raw mohair price when the market is oversupplied. Indeed the mohair industry in the United States of America developed their own trade mark in the mid 1980's in response to their perceptions need to promote the excellent attributes of Texan mohair. There have also been concerns in both the USA and in South Africa regarding the importation of Texan mohair into South Africa. South African processors have said that they had the capacity to handle the current total world mohair production and in so doing to more economically utilise their plants (Anon 1999c).

Mohair has seen severely depressed prices for most lines for several years until mid 1998. During 1997 for example, only 1% of fibre of 35 μm and greater and of 100 mm length or greater was sold. The Asian economic crisis led to devaluation of currencies making mohair more expensive in Asia. Import tariffs and quotas especially in India have also restricted trade in mohair. Adult mohair had an unhealthy dependency on the Far East market according to Mohair South Africa (Anon 1998d). In an attempt to overcome this Mohair South Africa was aiming product and market development specifically at the non-fashion market. Their focus was on a demand pull, market and product development of small and medium size mohair processing clusters (Anon 1999n). Their big issues in product and market development are easy-care mohair products and bending with cheaper artificial fibres. Recently van Heerden (1999) reported that some Italian spinners requested that Cape Mohair carry some certification. If this trend was to be established it would be following directly in the steps taken by the Australian wool industry in the early 1990's.

In the USA a price support scheme for mohair is being phased out. This change is regarded by some as being a major reason why world mohair prices have strengthened during 1998/99. World mohair production is at a 30 year low, with production from Turkey, once a producer of 35% of the total, now contributing only 4% of the total. Production has fallen from the peak in the late 1980's by about 60% to the present level of about 10 million kg. As a response to the significantly reduced production and the recent fashion swing back to fine mohair the price for kid and young goat mohair has increased significantly. The depressed prices during the mid 1990's have forced mohair producers to look elsewhere for a livelihood and new buyers and processors are saying the production is at dangerously low levels, especially fine kid (Weatherall 1999). The mean value for mohair tops during 1998 relative to 25 μm kid top were: 28 μm kid, 75%; super young goat, 51%; young goat 33 μm, 33%; adult 37 μm, 23% (Anon 1998w).

However in 1998 David Whitwam of British Mohair Spinners Ltd, and Chairman of the IMA Knitwear Group was reported as saying that the market was in most cases price-led and price-driven. «This situation has, in a very short period of time, seriously undermined and diluted mohair's perceived exclusiveness. The magic and the mystery of mohair is now translated in blends with acrylics, viscose etc. which, though their intrinsic properties, have gained increasing market recognition and credibility. Some of these trends and blends are to be commended. It is part of product evolution that good value and performance factors will do much to sustain mohair's presence at a number of levels. This is seen as positive exposure: the negative elements lie with ill-conceived, badly engineered yarns which, left unchecked, will do much damage to the industry». At the same time the IMA Menswear Group Chairman Peter Halstead said, «Price has been the critical factor in Japan... When prices have not been compatible, buyers have sought lower mohair-content blends or switched to other fibres. There is, worryingly, evidence of increased abuse of content description as customers seek to maintain cloth profile while devaluing quality» (Waddington 1998).

In Australia the need for mohair product development was recognised by 1990 with moves to appoint a product development officer and giving product development and marketing the highest priority for research (Slatter 1992). By 1992 research projects had begun and still continue. A review and assessment of all published mohair research was completed in 1992 (Leeder et al. 1998). As Slatter commented "Surely to develop a product its properties should be well known to producers, processors and consumers." Following a report to the IMA, Hunter completed a more comprehensive book on mohair properties (Hunter 1993).

One issue, which the mohair industry is very quiet about, is the perception of prickle in mohair fabrics. McGregor (1998a) recently briefly reviewed some research undertaken on wool, which has relevance to this topic. In brief prickle was once regarded as an allergic reaction in the skin of people wearing wool garments. However there is little evidence to support a true allergy to wool or mohair in man. Hatch (1984) reviewed the literature of reported dermatological problems related to fibre content and chemical content of textiles. Hatch's database included only one report of an allergic dermatitis attributed to mohair published in 1925. In summary it has been concluded that no cases of allergic contact dermatitis to wool had been documented for decades. The itch appears instead to be due to the pricking of the fibre. Any fibres over 30 μm can cause prickle sensations. When 5% of fibres are >30 μm most people regard textiles as being prickly. Surprisingly, about 35% of wool with a mean fibre diameter of 21 μm and all wool with a mean fibre diameter of 24 μm and greater have over 5% of fibres >30 μm. In Australia is now focused on reducing the mean fibre diameter and diameter variability in wool fleeces with mean fibre diameters of 21 to 23 μm (Dolling 1993).

CASHEMERE
Traditionally Chinese cashmere was purchased by European dehairing companies at the Canton Fair in April and October each year. Additionally since 1995 the Qinghe International Cashmere and Wool Trading Fair has been held in October, sponsored by the Hebei Province and the China National Textile Council. Cashmere wools are also purchased through the Animal By-Products Corporation. Now cashmere can be bought from many trading companies and individuals. Large processing companies now need to be present or have on-ground agents in China through out the year. Three other factors are also important:

632 7th International Conference on Goats, France, 15-21 May 2000
1. Governments within China are seeking to develop their cashmere industry. For example, the Government of Inner Mongolia has been promoting the cashmere industry and plans to become the largest processing and trading centre in the world. According to JNT Weekly (Anon 1997d), there are 100 cashmere processing enterprises with processing capacity exceeding 10,000 y/ year. Large processing enterprises have emerged in Inner Mongolia including E'erdush Group Corp., Luwang Cashmere Group Corp., which purchased about 90% of the cashmere from the nine major cashmere producers in Inner Mongolia.

2. The deregulation of prices resulted in farmers being paid significantly higher prices for cashmere and so herdsmen increased herd sizes. Thus production of cashmere increased significantly, for example cashmere goat numbers in Inner Mongolia increased 15% during 1995 and increased a further 10% during 1996 (Anon 1997d).

3. The Ministry of Foreign Trade & Economic Co-operation introduced a new system of annual export quotas. Since 1995, changes in the quotas, which have been designed to "guarantee" a supply of raw cashmere for Chinese and joint venture companies in China, and a fall in international demand associated with the Asian economic crisis, has resulted in an oversupply of cashmere being sold for export. The resulting dramatic fall in cashmere prices has now seen herdsmen begin to slaughter goats with reports of up to a 25% reduction (Anon 1999n). Further pressure on prices may be related to the reports of the smuggling of half of Mongolia’s annual cashmere clip into China (Lamb 1999). According to Mr. R. Lamb, executive director of Mongol Amicable, this smuggling avoids various taxes and alsoChinese sources to undercut Mongolian cashmere by US $5 – $10 per kg. Apparent smuggled brown cashmere, which makes up 60% of Mongolia’s production but only 10% of Chinese production, is blended with Chinese cashmere. With the deregulation of the cashmere marketing structure comes the increasing concern of contamination. To combat contamination Joseph Dawson introduced cashmere-quality specifications to all contracts in 1990, with arbitration taking place if required in China (Liddle 1998). The system set up by Dawson’s includes mobile staff, carrying a suit-case housed laboratory, who visit supply locations and carry out initial sample tests. I have heard of reports of agents on motor bikes with satellite telephone connections that follow herdsmen to their harvesting locations in order to secure purchases. Similarly the Italian company Pettinatura Fibre Premiato buy direct from growers in Mongolia and China and have one of their directors stationed there to ensure strict control over quality and purity of raw cashmere (Anon 1998g).

The economic crisis in the Far East has totally stopped the growing trade of luxury fashion items to South Korea and has particularly affected fine-cashmere knitwear (Roberts 1986a). The economic crisis has also hit Japan and regions where Japanese holiday such as Singapore, Roberts commented that for the Japanese virtually any luxury goods made and brought outside Japan are seen as bargain-priced due to the high level of import duty imposed on goods entering Japan.

Just in time ordering is now a feature of the cashmere market according to Mr. B. Lederman, of Fibre Resources Group, Prato, Italy. Customers are now only buying cashmere against confirmed production needs. Importers also become very cautious given the recent very week prices (Anon 1998s). However the low prices means that cashmere can be used in more products. All these changes in the structure of cashmere manufacturing and exporting will make the export cashmere market more volatile as increases in demand will now be channelled thorough smaller export quotas, along a thinner marketing pipeline, via a lesser number of larger cashmere marketing outlets in China with sudden upturns or downturns in demand more likely with just in time ordering. Since this paper was commenced the demand for cashmere remained weak until May 1999 with prices rising rapidly in July and August 1999 to $US 84 for 38 mm white Chinese dhém (Anon 1999n).

Current world dehaired cashmere production is estimated by J.F. Muller Co. AG, Thernwil, Switzerland, at 4,500 tonnes (Anon 1999c) compared to 2,700 t in 1986. This originates from China (3000 t), Mongolia (1000 t) and other sources including Iran (500 t). Muller’s feel that the uncertainty in China is under mining the whole cashmere market and this situation is much worse than any time in the past 10 years. Chinese fibre companies now trade directly in Europe, which did not happen in 1986.

### Table 1

Recent exports of specialty animal fibres from China

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity (tonne)</th>
<th>Value (US $ millions)</th>
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<tr>
<td></td>
<td>1997 #</td>
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<td></td>
<td>1997 #</td>
<td>1998 *</td>
</tr>
<tr>
<td>Cashmere wool</td>
<td>2,257 (-9%)</td>
<td>2,003 (-11%)</td>
</tr>
<tr>
<td>Raw silk</td>
<td>11,089 (-8%)</td>
<td>9,169 (-17%)</td>
</tr>
<tr>
<td>Rabbit hair</td>
<td>4,029 (+1%)</td>
<td>2,808 (-35%)</td>
</tr>
</tbody>
</table>

# Anon 1998t, * Anon 1999c

The average price of exported Chinese dehaired cashmere in 1996 was $US 73.2 /kg, a fall of 4.2% (Anon 1998v), but this had fallen to $US 67.1 in 1997 and $US 50.0 in 1998 (see Table 1). Since 1994 the quantity of cashmere exported from China has fallen from 5,300 t to about 2,000 t per annum (Anon 1998v).

The Qinghe region in China, is now the biggest distribution centre for raw cashmere with over 100 processors with 4,000 knitting machines, producing 2,000 t cashmere yarn and manufacturing 5,000,000 pieces of cashmere knitwear (Anon 1998u). In recent years new cashmere knitting works have been established in China, Hong Kong, India, Mongolia, Mauritius, Madagascar, Italy and Portugal (Anon 1997b). Privatisation of state owned cashmere works is progressing in the Far East. In Mongolia the Gobi Corporation, which processes 1000 t (about 50%) of Mongolia’s cashmere and produces 300 t of dehaired cashmere and 300,000 knitwear items annually will be sold providing funds to expand fabric-finishing facilities (MacMillan 1999). According to Textile Asia (1998v) the domestic annual processing capacity in China reached 15,000 t of raw material in 1997 up from 9,595 t in 1996. Thus there is no way of keeping all the cashmere textile plants operational. The average dehaired cashmere yield of the 1998 raw cashmere fibre was reported to be 40%.

The Australian cashmere industry developed their own cashmere and developed their own cashmere textile industry in the early 1980’s and since 1988 have used it as a quality mark on classified and sorted cashmere sold in branded bales by their Australian Cashmere Marketing Corporation (C. Gould pers. comm.).

### Cashmere Substitution

The Cashmere and Camel Hair Manufacturers’ Institute (CCHMI) believes that the «Mis-statement of fibre content in cashmere and cashmere blend garments constitutes a multimillion fraud on the consuming public and damages legitimate cashmere producers and the image of the fibre» (Spilhaus 1998). The idea is that cheaper fibre is substituted for cashmere. The term “cashmere” is essentially a trading definition.
with an “arbitrary” maximum fibre diameter cutoff of \(18.5 \pm 0.5 \, \mu m\). The CCHMI effectively wish to enforce this definition. Frequently the cheaper fibre is wool but camel hair and yak have all been identified in mislabelled garments (Phan et al. 1998). Consequently the recent development of DNA fibre profiling techniques allows the accurate identification of species origin from samples as small as 20 mg. Even in scoured, bleached or dyed fabrics and finished garments the use of the PCR techniques allows extraction of enough DNA to provide DNA sequences (Hamlyn 1998).

**Cashgora**

In 1972 the word cashgora was first used, by Ms. J. Maddocks, to describe goats whose fleece had a mean fibre diameter (mid) >18 \(\mu m\) and a percent of fibres >30 \(\mu m\), i.e. fleeces which were outside the then United States of America Trade Department cashmere specifications, and whose mid distribution of down (secondary) and hair (primary) fibres sometimes overlapped (Moylan and McGregor 1991). In June 1988 the International Wool Textile Organisation included «cashgora» for the first time in the IWTO Blue Book. As an animal fibre or «wool», cashgora has since been covered by IWTO rules relating to commercial transactions of «wool».

Recently cashgora was added to the official list of Textile Products content regulations of the UK to enable cashgora to be added to content labels (Anon 1998). This change in content label regulations in the European Community may provide the greatest positive impetus for cashgora as a legitimate textile fibre.

However there are differing definitions of cashgora.

1. **Commercial evaluation of «cashmire» fleeces in Australia during the early 1980’s showed that some fleeces had an unacceptable incidence of «intermediate» fibres, essentially fine guard hairs, which could not be dehaired from the downy undercoat, as the fibre diameter distributions of the hair and down overlapped (Smith, Blackburn and Ross 1985). Breeders in Australia have been advised to sort this fibre as «cashgora» by the Australian Cashmere Marketing Corporation (ACMC) (Corrigan 1987). Clearly if the fibre cannot be properly dehaired this type of cashgora has no commercial value and is rubbish. Such fibre exists in China (McGregor unpublished observations). In Australia the goats growing this type of cashgora fibre were Angora crossed breeding, goats which have since been vigorously culled.

2. **Based on Maddocks definition there is what I will term «strong cashmere «cashgora», mid 19-22 \(\mu m\). This strong cashmere has good guard hair: down differentiation and is easy to dehair. Some goats in Australia grow fine cashmere in their first year but the down coarsens as the goats grow and at subsequent harvests the goats may produce «strong cashmere» (McGregor 1998b). For some years this strong cashmere was confused with and/or sold with the cashgora described in the first definition (McGregor 1991, 1995, 1997). Essentially New Zealand cashgora falls into this second category.

3. **Researchers at the German Wool Research Institute (GWR1) have attempted to classify cashgora and cashmere based on certain fibre properties including fibre diameter and fibre cuticle scale dimensions without reference to guard hair: down differentiation (Phan et al. 1988) although recently they appear to have unwittingly adopted Maddocks definition (Phan and Wortmann 1995). They have also coined a term «crossbred cashmere», with apparently little knowledge of the actual animal production system in Australia, or of the confusion that such a term may bring to this debate. It is understood by the author that the samples of Australian fibre studied by GWR1 were obtained before the ACMC developed and implemented their comprehensive quality control, fibre classification and sorting procedures, which are required prior to branding Australian cashmere with the Australian Cashmere Trade Mark. These procedures have been in place now for over a decade.

The ACMC and cashmere marketing bodies in New Zealand have sold cashgora lots alongside their cashmere for over a decade. Currently cashgora lots have a mid range of 19 - 22 \(\mu m\), with low to medium lustre. The New Zealand cashmere industry developed a marketing channel for their cashgora with R. Friedlin & Co. of Switzerland (Friedlin and Petit 1988). Cashgora was promoted as the «new pearl of the Pacific» and a Trademark was registered. The association collapsed when financial problems beset Friedlin’s companies. Another New Zealander, Mrs. D. Dusi, registered her own cashgora Trademark in the early 1990’s.

While production of cashgora in Australia has slumped production of «strong cashmere» may be rising in Mongolia. Mongolia used to enjoy a substantial goat meat trade with the Soviet Union but since the break up of the USSR mandatory culling of older male goats has ended. This has resulted in the cessation of culling of male goats when they reach 2 years of age. Consequently the production of strong cashmere has increased with the average diameter increasing from 16 \(\mu m\) to 17 to 19 \(\mu m\) (Lamb 1999).

Research in Germany (Albertin et al. 1990) reported that while cashgora was subjected to the same treatments as cashmere the impression predominates that cashgora can more easily be spun, probably due to longer down lengths. They found no differences in the colourfastness of the cashgora and cashmere samples but a much greater tendency of cashmere to pill compared to the cashgora.

**IMITATIONS OF CASHMERE**

A new process, which stretches wool slivers following chemical and physical processing, has been registered as «Optim». The process can reduce 19 \(\mu m\) wool to a 16 \(\mu m\) Optim fibre. These Optim fine fibres enable the production of trans-seasonal lightweight fabrics with cashmere-like properties of soft handle, subtle lustre and silk-like touch (Anon 1998k). Other products have used «cashmere-like names” to gain some market advantage. Marubeni-Lida has produced the synthetic Cashmilon, a fine 3rd filament or staple product. Auderset SA of France, promotes “Cashmino”, which “is some of the world’s softest merino” after an introduction “200 years ago our town introduced CASHMERE to the industrialised world. Today Audersset the world’s oldest cashmere spinner presents Cashmino” (Anon 1997a). Zegna Baruffa, Italy sells «Cashwool», a 19.5 \(\mu m\) Merino wool for active sport’s wear (Anon 1999h).

**TRADITIONAL USAGE OF MOHAIR AND CASHMERE**

**Mohair**

Mohair is renown for its lustre. Mohair takes colours brilliantly and adds lightness and warmth to textiles. Hunter (1993) listed over 180 products for which mohair has been used ranging from airgun darts and artificial hair to paint rollers, velours and women’s wear. In the mid 1980’s the end uses of mohair were: 65% hand knitting yarns, 15% men’s suiting fabrics, 12% women’s woven accessories and rugs and 8% woven furnishings and velours (Buxton 1986). By the early 1990’s van der Westhuysen (1992) gave the end-uses of mohair as: 70-80% brushed knitwear, 10% ladies wear, 71-10% home furnishings, 7% menswear and 1% home industries. In the space of about 7 years the significant trade in hand knitting yarns had all but disappeared and New Zealand had developed wool tropical suiting material displacing mohair tropical suiting from the Japanese markets (Carnaby et al. 1985). Thus by 1992 the majority of the uses are subject to definite fashion cycles while only household soft goods (velour, blankets) and to some extent men’s suiting, in total representing only 10 to 15% of the mohair market, may not be subject to fashion.

**Cashmere**

Cashmere provides lightness and warmth. As a luxury fibre cashmere is regarded by many as the premier soft handling natural fibre. Fine cashmere (14 to 16 \(\mu m\)) from China and Mongolia has primarily been used in knitswear where manufacturing and retailing margins are higher. Coarser cashmere (17 to 19 \(\mu m\)) from Iran and Afghanistan has been used for woven fabrics. Cashmere has been used for knitswear, coats, sportswear, rugs, scarves, gloves and carpets (Anon, 1981).
When the then worlds leading cashmere dehauling and manufacturing firm Dawson’s International arrived in Australia in 1980 they dehaired 60% of world production and through a vertically integrated company sold knitwear though leading brands. Dawson’s once described their marketing approach for cashmeres as follows “Being expensive, it (cash-mere) depends very much on colour, style and design of its textiles, which have an air of classicism and refinement.” (Anon, 1981). Typically cashmere woven goods for fine men’s suiting consist of blends with super 120’s, 130’s, 140’s or 150’s wool. Sometimes such fabrics consist of 100% cashmere but usually contain only 10 or 20% cashmere. Cashmere being added to the fabric handle and marketability.

NEW PRODUCTS
The textile manufacturing industry, like all other industries, has to find new product development, prediction of consumer taste, trends in material costs and confidentiality. It is only possible to report on some of the new products following publication of details in trade journals.

MOHAIR
The brushed hairy look for mohair, which was so fashionable in the 1970’s, is making a comeback (Waddington 1998). The CSIR in Port Elizabeth have embarked on an easy-care mohair product with the aim to meet the demands of modern lifestyles (Anon 1997b). Mohair has been used as the base for mohair-wool blend knits. Mohair makes T-shirts, knitted goods and other Wools in fashion and is used in the creation of sweaters, striped and other knitwear. Mohair’s handle is soft and fluffy, with a slight sheen. The fibre is absorbent and has a high moisture content. Mohair is strong and can be used for outdoor wear and in sports wear. Mohair is also used in the production of baby clothes, children’s wear and household textiles.

CASHMERE
The record low prices for cashmere during the past 2 years have provided designers with an inexpensive opportunity to develop new products. For example cashmere trousers (Anon 1997c), which were part of a collection designed to set the “younger more contemporary mood”, cashmere cat suits and lounging pyjamas (Anon 1998b), cashmere underwear sets (£150), sofa cushions, throws (£275), teddy bears and dog coats (Roberts 1999a, Anon 1998m) along with cashmere hats, gloves, socks and blankets. Eveningwear items include cashmere voiles and gauzes, and “Pashmina” shawls made from Himalayan cashmere brought from India (Anon 1998b). In the 1998 couture collections items of felted, textured and double-faced woven cashmere were displayed but their utility was questioned (Anon 1998c). At the 1998 Pitti Filati yarn exhibition cashmere made its appearance in summer wear (Anon 1998e) where the feeling of soft light fabrics was obtained by knitting very fine yarns on large needles to give a thick but soft feathery effect.

The casual look is relatively new for cashmere and is targeting the younger more affluent market. Ralph Lauren recently displayed cashmere sweaters with designer jeans, cowl neck cashmere jumpers ankle length skirts and a 100% cashmere duffle coat (Roberts 1999a). In men’s wear 21 and 30 gauge fine-ply cashmere sweatshirts and matching jogging pants have been developed (Anon 1998b, 1999e). King Deer Cash-mere Co, Baotou, China has made superfine yarns of Nm 2/60 and 2/80 and woven men’s shirts since 1996. N. Peal produced a cashmere, Lyca, polyamide blended yarn ideal for sweatshirts (Anon 1997c). In 1997 Bally of Switzerland produced a cash-mere yarn with polyester, which allows the fabric to stretch and is easier to dye than elastomeric fibres (Anon 1999n).

With the fashion for yarn including textured looks Bal-lyantye Cashmere Company introduced a bubbly surfaced yarn composed of 3 ends of conventional cashmere yarn and one of slubbed cashmere. Ballantiney produced cashmere T-shirts in 1997 and altered stitch construction for the 1998 T-shirts. They also produced honeycombebladed blouson jackets and polo shirts with sport zips rather than buttoned collar for men (Anon 1998a). However the Managing Director of Ballyantye believes that the main sales of cashmere are in what people call classic designs, but what he called updated classics (Anon 1998p). These updated classics are the Argyle, the biggest seller in intarsia for men, and the twin-set redesigned for better fit.

For knitted ensembles for evening wear Todd & Duncan introduced cashmere with gold or silver Lurex. The company also produces a new blend of 53% cashmere 47% mohair yarn and an 18/2 blend of Geelong lambs wool, alpaca and cashmere. Todd & Duncan now produce yarns to cope with the demands for greater knitting speeds requiring greater yarn tensile strength but sold in smaller batch sizes (Anon 1998n).

Cashmere-silk blends have been available for several years (Roberts 1998a) but designers are continuing to develop new yarns. A shabby silk yarn look has been developed by Loro Piana which retains the handle of cashmere (Roberts 1999a) and another yarn (94% cashmere and 6% silk) used a spinning technique to impart a wavy appearance, which in fabric will exhibit a (sho)colour effect similar to a flame (Anon 1999j). Zegna Baruffa most expensive yarn ever produced contains 75% cashmere and 25% metallicised fibre for designer outfits (Anon 1999h). Experiments are being carried out on blending a new version of Tencel, A100, (a non-fibrillating lyocell) offering improved wash and wear performance and claimed more vibrant colours (Roberts 1998c). Cashmere has also been blended with viscose to create super soft lustrous garments (Anon 1998p).

New fabrics exhibited at the 1998 Premiere Vision exhibition include stretch wool/cashmere fabrics targeted at the casual-wear market. New fabrics include 270 g/m² twill based 100% cashmere woven to give a lustrous surface (Roberts 1998b). The continuing trend for lighter woven fabrics is illustrated by the decision of Johnsons of Elgin. Following a devastating flood they have redesigned their collection of cashmere jacketing which will be 10% lighter than they have been for the last 20 years (Anon 1998o). This involves producing finer yarns made from 14.5 to 15 µm Chinese cashmere. “The secret is to create a worsted look from a woolen yarn and to retain the soft handle of a woolen cloth”, the technical director said to the Wool Record. Cloths offered range from 240 g/m² to 550 g/m². At the 1999 London MXL men’s-wear show the soft touch of cashmere in classic business suits was a feature. While camel remains a favourite colour for overcoats the fabrics are less likely to be camel but rather wool and cashmere blends dyed to camel shades (Anon 1999k). Such camel may have been dark cashmere, bleached and then dyed.

To attempt to exploit the cashmere consumer’s interest in exclusive textiles companies frequently develop innovative names for new seasons colour ranges or yarn compositions. Eg “Platinum” is a range targeted to “those consumers who give
quality priority over price" (Anon 1998a). Zegna Baruffa from Biella, Italy have released their "Exclusive" range of woolen-spun yarns for weaving and knitting in extra fine 2/45'sNm 100% cashmere, which is about as fine as can be spun on the woolen system.

CASHGORA

Cashgara products are all new to consumers. Experimental woven fabrics were used to produce scarves and shawls during the 1980's but little reached retail outlets. Several important processors of Mohair and cashmere believed that cashgara had good market potential and have promoted cashgara products (Anon 1989). William Edleston & Co, Bradford, have successfully spooled 15% cashgora and 30% marker wool blends (Anon 1990). In Australia Belisa Cashgar have produced cashgora knitwear, since 1994, including a range of men's and women's wear. They claim cashgora is longer wearing, easier to wash and pills less than finer cashmere garments (Cooper 1996). They have observed that there is little difference in processing 18.5 μm cashmere and fine cashgora (Anon 1992b) but cashgora over 20.5 μm processes differently. McGregor (1997) reported on the processing of a type of coarse cashmere into tops, some of which was processed into scarves by Belisa. In New Zealand a range of cashgora products have been produced including knitwear, rugs and hand knitting yarn. Mrs. D. Duijs of Auckland produced 70% cashgora, 30% wool hand knitting worsted spun yarn in 4 and 8 ply. She has also produced cashgora machine knitting yarns of R55/2 tex, woven cashgora suit fabric, motor racing fire resistant cashgora garments and cashgora outdoor wear (Anon 1992, and pers. comm.).

NEW PROCESSING

In Australia Jindalee Fibre Developments is developing a new early stage processing system, which reduces the damage to fibres and results in a higher yield of fibre at a reduced cost for small lot processing. This new system is an alternative to conventional carding of scoured fibre (Leder 1998). Tecnomeccanica Biellese, of Italy, new blending system allows specialist woolen spinners to process lots ranging from 50 to 1000 kg. The two independent automated blending lines serve three woolen-carding sets. Auto-cleaning of carding and spinning machinery provides labour efficiencies while new equipment to vary the speed drive and electronic count control at the card condenser ensure quality control and uniformity (Anon 1998a). James Holdworth & Brothers Ltd, of West Yorkshire produce speciality card clothing for cashmere spinners. Card clothing must be of sufficient standard to reduce wastage and imperfections in superfine cashmere used in fine hosiery and delicate fibre card clothing up to 1.000 point per square inch are manufactured. The population of the setting of the wire, the sharpness of the point and the levelling of the carding surface are of critical importance in the quality of the end product (Anon 1998d).

New investments by cashmere manufacturers typically use modern wool spinning equipment. For example Mongol Amicale have installed a Tatham card, Gaudino spinning frame and a Savio winder at their new cashmere scouring and dehairing facility at Ulaanbaatar (Lamb 1994). Joseph Dawson has developed new dehairing equipment to run in their air-conditioned plant in Baotou, Inner Mongolia. Dawson’s have installed 14 dehairing lines, and cashmere-combing equipment. A large percentage of the dehaired cashmere is destined for associated company Tood and Duncan woollen-yarn spinning works in Scotland. The Baotou centre is part of Dawson International's Chinese co-operative joint venture with the operation to secure the long-term supply of cashmere to the company. Apparently the air-conditioning removes the moisture from the air conditioning systems often used during dehairing (Liddle 1998). Meanwhile J.F. Mathers and Sons Ltd and Dawson are developing their dehairing process to further preserve and improve the length of dehaired and combed fibre (Anon 1999k). William Tatham Ltd, of Rochdale UK has developed a Fibre Separator which can process cashmere before it is dehaired to remove dust, vegetable matter and other contaminants. Tatham's have also introduced an automatic dosing system that can be retrofitted to all stationary woolen-card creels. The system increases card efficiency by 12% (Anon 1999).

Elite Fibres in Victoria Australia, who process speciality fibres and wool, are the first in the world to install CSIRO's Sirolan CF waste-treatment technology, an environmentally sound system that converts waste from scouring into compost (Thomas, 1999).

Schlafhorst has reported that its open-ended rotor spinning equipment can spin yarn in the range of 7 to 50 Nm. Schlafhorst are studying the processing of pure wool on their system and reported that when using rotor diameters of 46 and 56 mm the following conditions were required: the number of fibres in the cross section must equal 120, the maximum length of fibres should not exceed 60 mm, the residual grease must be less than 0.5% and the yarn has to be twisted (Anon 1998c).

Meanwhile one Australian company, Rocklea, has launched a blended yarn of 70% combed cotton and 30% wool for knitted and woven fabrics. Fine wool with a narrow fibre-diameter distribution is used. The fibres are ring spun following adjustments to the ring frame to allow the wool to be spun inside the cotton (Anon 1998b). A specially designed two stage dyeing process has been developed involving wool-reactive dyes under neutral to slightly acidic conditions followed by high-strength cotton-reactive dyes being fixed with the minimum amount of alkali.

A new process has been developed by Nuance Ltd, UK, allowing the controlled change of colour of woolen-spin yarn during manufacture. The rates of shade change can be varied from 50 to 2000 m's in a single length of yarn according to designer specifications. Nuance has processed cashmere in 1/l/4's count for use in high fashion items including sweaters, twin sets, socks and accessories (Anon 1999c).

The recent introduction into cashmere companies of Shima Seiki computer controlled knitting machines has revolutionised the type of garment that can be constructed. Shima machines can produce rib and stitch effects allowing a wide range of traditional and new designs to be manufactured. Shima machines include needle spacings of 5, 8 and 12 per inch allowing a range of garment weights to be constructed. However to achieve cost effective production from the Shima machines excellent quality yarns must be specified. The fully-finished Shima knitting machines minimise yarn wastage by only knitting required fabric.

New developments in weaving now enable changes in design to take less than 30 minutes according to Lindauer Dornier (Anon 1999d). At the 1999 International Textile Machinery Association (ITMA) conference Dornier demonstrated these changes, on a rapier loom running at 500 picks per minute, by changing worsted fabrics of up to 8 colours from a 2 x 2 all-wool twill (32 pick/cm, 31.5 end/cm, and width 187 cm) to a cashmere cloth 2 x 2 twill (25 pick/cm, 24 ends/cm, and width 183 cm).

A new attachment for looms has been developed which allows an increase in the recycling of waste fibre. The patented device by Dornier will provide the greatest benefit to weavers of expensive luxury fibres by minimising fibre lost in selvage (Anon 1998r).

While Fratelli Piaenza the Italian company, which began experimenting with cashmere processing in the 1920's, prefers to use modern Dornier looms they run them at well below maximum speeds when pure cashmere coatings are being produced in order to preserve the quality of the woven piece. Piaenza also believes that adoption of new technology is beneficial if the result gives better production without affecting quality. But in finishing they raise the cloth using the traditional processes, as they believe that clothes dressed with the teasel do not pill. Piaenza pile cloths are finished by Krantz drying and shearing to ensure high lustre (Anon 1998b).