Cashmere from Australia

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Cashmere is the 'cream' of fibres in the garment industry, with processors paying up to $110 a kilogram for quality white cashmere. This highly sought-after fibre is the soft superfine undercoat of goat hair produced by the secondary follicles of a certain type of goat. The undercoat normally grows during the cooler months of the year and mouls in spring.

At least 30 per cent of the Australian feral goat population today could produce reasonable quantities of cashmere which, until now, was being shed and lost in the wild. Fibre processors and goat producers are working towards establishing a new industry in the country, with Western Australian goats playing a major part.

Fibre characteristics

Cashmere fibre has a coarse wavy structure with no crimp. It is tough, machine-washable and non-felting. Cashmere has a fibre diameter ranging from 8 to 25 microns, making it one of the finest of the animal fibres used in the clothing trade. Colour ranges from white, grey to brown and chemically cashmere is similar to wool and mohair. On a comparable weight basis, cashmere reportedly has three times the insulating value of fine wool.

The term cashmere is apparently derived from the geographic region of Kashmir in Asia. Peasant tribesmen herd cashmere goats in the mountains and plateaux of Asia, from Turkey to the Himalayas, Mongolia and China. China produces 90 per cent of the world's fine cashmere production of 3500 tonnes per year. Throughout these countries, cashmere production is very primitive. In spring, the
moulting animal is hand plucked, reportedly yielding 200 to 250 grams of cashmere per goat.

**Uses**

Cashmere’s softness, lustre and lightness make it a symbol of the highest quality in clothing. It is primarily used in the knitwear trade for sweaters, ladies sportswear, shawls and coats. Six goats are needed to produce enough fibre for one cashmere sweater or 40 goats for an overcoat.

Table 1 shows the world prices paid for cashmere fibre in March 1984.

**Australia**

In 1973, CSIRO researchers observed that feral goats captured in New South Wales carried cashmere fibre. After further investigation they estimated that 20 per cent of the Australian feral goat herd could produce useful quantities of cashmere. More recent work in Western Australia and other States suggests that at least 30 per cent of feral goats produce reasonable quantities of cashmere.

There are an estimated two million feral goats running throughout Australia (see Figure). These are descendants from goats introduced into the country by early mariners and settlers to provide food. Breeding goats escaped or were released into the bush and became feral on pastoral holdings. They adapted quickly to the dry harsh environment and settled into a permanent population throughout the continent.

Western Australia has the nation’s highest feral goat population and is the only State to declare feral goats as vermin. The official policy under the Agricultural and Related Resources Protection Act (1976) is eradication. The farming of feral goats here is prohibited unless a permit is granted from the Agriculture Protection Board.

In 1980, China stopped exporting raw cashmere and started to process and manufacture its own garments. This sudden halt to the supply of raw fibre caused the world’s largest processor of cashmere, Joseph Dawson International of Scotland, to seek another source. After considering various countries, Dawson’s came to Australia. Their decision was influenced by Australian management expertise in animal fibres gained from the Merino sheep industry and by the feral goat population estimates.

**Cashmere in Western Australia**

In July 1981, Dawson’s approached the Western Australian Department of Agriculture to investigate the potential for cashmere production from feral goats run under agricultural conditions. A project was established at Avondale Research Station, Beverley, in the State’s sheep growing area.
In September 1981, feral does trapped on three pastoral holdings in the Carnarvon area were taken to Avondale. Other does from the Murchison and Leonora areas were added to the base herd. At the time of trapping, there were no visible signs of cashmere production on any of the animals.

Results and discussion
In 1982, the first year of running the herd, the research concentrated on basic observation and management experience. The goats were run at district stocking rates of five sheep per hectare and received no supplementary feed. In May the does were joined to upgraded cashmere bucks from New South Wales. All animals were shorn in mid August and kidding started in October 1982. Tables 2 and 3 show fibre yields and kidding rates for 1982.

By the end of 1982 the feral goat had adapted well to the first year of domestication. Although the unselected feral doe herd produced small amounts of cashmere (average 28 g/head), the best 20 per cent of does produced at least 75 g of cashmere.

In 1983, the dry paddock feed was supplemented with a quality ration to investigate the effect of better nutrition upon cashmere production.

The 227 feral does at Avondale were divided into three groups. The control group grazed pasture only. The second group grazed pasture and fed an additional 300 g/head/day of an 80:20 oats-lupin seed ration. The third group ate as much as they wanted—up to 700 g/head/day—of the same ration. Supplementary feeding started in mid January and finished in early June 1983. The supplement contained 16 per cent crude protein and was fed three times a week from self-feeders in paddocks.

Goats were weighed every month. In May 1983, each of the three groups were divided into six single sire mating groups. Mating with three commercial bucks from Joseph Dawson's Kinross Cashmere Company, New South Wales and three bucks from Bernier Island near Carnarvon started in mid May and continued for six weeks.

All does were shorn in mid July. Total fleece weights were recorded and a sub-sample from each fleece was sent to Dawson's laboratory in Scotland for analysis for cashmere yield, colour and fibre diameter. The does ran as one herd until kidding in early October, when they were again divided into the same six groups. Newborn kids were tagged and weighed.

Fleece measurements for these does are shown in Table 4. Down production from unselected feral does grazing only pasture averaged 55 g, nearly twice the 1982 average production of 28 g. However, the yield of cashmere did not increase as a result of supplementary feeding. At Avondale in 1983, the top 30 per cent of the feral does produced from 95 to 201 g of cashmere.

The level of fertility in the feral does was not affected by different levels of feed supplementation around the time of mating. More than half the does in all three feed groups produced twins (Table 5).

The few deaths between parturition and weaning of kids at 10 weeks indicate that when there are no predators the feral goat survives well.

First cross female progeny born on Avondale in November 1982 were shorn for the first time in July 1983. Their cashmere production at 9 months of age and that from mature feral does at the same shearing are shown in Table 6.

Table 6. Fleece yields for first cross does compared to feral adults.

<table>
<thead>
<tr>
<th>Feed group</th>
<th>No. of does</th>
<th>Does kidding (%)</th>
<th>Does twinning (%)</th>
<th>Kids born (%)</th>
<th>Kids dead (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>66</td>
<td>74</td>
<td>55</td>
<td>124</td>
<td>10</td>
</tr>
<tr>
<td>300g/day</td>
<td>65</td>
<td>71</td>
<td>54</td>
<td>114</td>
<td>0</td>
</tr>
<tr>
<td>Free feeding</td>
<td>66</td>
<td>73</td>
<td>60</td>
<td>121</td>
<td>2</td>
</tr>
<tr>
<td>All treatments (combined)</td>
<td>197</td>
<td>72</td>
<td>56</td>
<td>120</td>
<td>4</td>
</tr>
</tbody>
</table>

First cross does (9 months) | Feral adults (mature)

<table>
<thead>
<tr>
<th>No. shorn</th>
<th>Average cashmere/doe</th>
<th>Yield of cashmere in total fleece</th>
</tr>
</thead>
<tbody>
<tr>
<td>119</td>
<td>90g</td>
<td>59g</td>
</tr>
<tr>
<td>38%</td>
<td>19.6%</td>
<td></td>
</tr>
</tbody>
</table>
There seems little prospect for boosting the relatively low down production from unselected feral stock. The future emphasis in production research to achieve a viable cashmere industry in Western Australia will be on better breeding and upgrading of feral goats.

**The future for cashmere**

About 230,000 goats are farmed in Australia today to produce about 15 to 20 tonnes of cashmere a year. One processor, Joseph Dawson International, says it needs 1000 tonnes of Australian down a year. The average herd in Australia consists of about 200 goats, with 50 producers running herds of 100 goats or more.

On present production levels, a national herd of six to eight million goats would be needed to satisfy the current requirements of this one processor.

Samples of Australian cashmere have aroused considerable interest from processors in Japan, Italy and the United States. It seems the only limitation to cloth production is the restricted supply of the raw cashmere fibre.

**Commercial goat farming**

Goats are easily managed animals that adapt quickly to commercial farming. They are browsing animals and have different dietary habits to other domesticated livestock. To a certain extent, goats and sheep are complementary animals for they graze different species within a pasture. Goats prefer grass and roughage, eating barley and brome grasses. They leave both green and dry clover and as a result the clover content of the pasture may increase. Goats can graze on stubble over summer although they will need some supplementary feed such as hay during April and May.

In Western Australia, the Agriculture Protection Board must approve the fencing before a commercial flock can be established with feral goats. The present requirements are for a compound area with 1.5 metre high fences, having one strand of barbed wire at the bottom and three strands at the top.

The only modification needed to the conventional 1.2m—eight-strand sheep fence is the addition of a strand of barbed wire to the top and bottom. Electric fencing is also effective and approved by the Agriculture Protection Board.

The feral goats are generally contained within the compound for two to three months, by which time they are considered suitably domesticated for release into paddocks. Agriculture Protection Board inspectors determine when the goats can be released.

On improved grasslands, goats can be run at the same stocking rate as sheep. There is no scientific evidence available to support the claim that goats can be stocked at a higher density than sheep.

Feral goats can tolerate a wide range of climatic conditions and can be run with either sheep or cattle. Because sheep and goats are prone to the same internal parasites, existing vaccination and drenching programmes can be used on the goats.

The main external parasites which affect goats are the biting red louse *Damalinia caprae* and the sucking blue louse *Linognathus stenopsis*, both specific to goats. They do not survive on sheep. Goats do not suffer from flystrike.

Goats produce fibre, meat, milk and skins. Western Australia has a strong export market for goat meat or chevon. In 1982-83, about 80,000 goat carcases were exported to South-East Asia, Mauritius and the West Indies. Further expansion of these markets is limited by the inconsistent supply of goats to abattoirs, processing anomalies and lack of market information.

The goat meat market is highly important to the total profitability of cashmere production. A stable scheduled price for all types of goat meat has existed for the past four years. This allows goat producers to sell reject stock at a uniform price throughout the year.

**Conclusions**

Western Australia has the largest feral goat population in Australia. The composition of these herds is not known but research at Avondale has confirmed that at least 30 per cent of these animals could produce reasonable quantities of cashmere. The opportunity for a goat industry based upon goat meat and cashmere fibre seems to be generally overlooked at present. The research at Avondale has also confirmed the belief that goats are as easily managed as sheep provided fencing is upgraded.

![Cashmere goats showing two lengths of guard hair.](image)