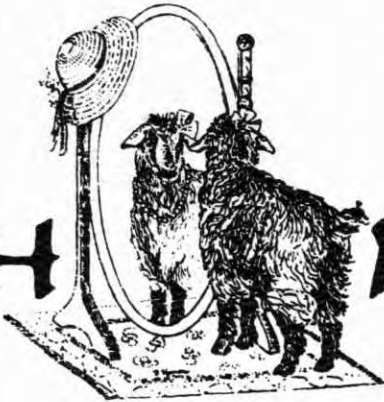




CASH MIRROR

VOLUME THREE, ISSUE FOUR

FEBRUARY 1992



\$2.50

CASHMIRROR

CASHMIRROR REFLECTING THE CASHMERE INDUSTRY

Published each month by: **THE FARM**,
P.O. Box 639, Toledo, Wa. 98591 206-
864-4200, Fax: 206-864-4201

The entire contents of this newsletter are copyrighted. Reproduction in full or part, whether photograph, copy or sketch, is strictly forbidden unless written permission has been given by the Publisher prior to publication.

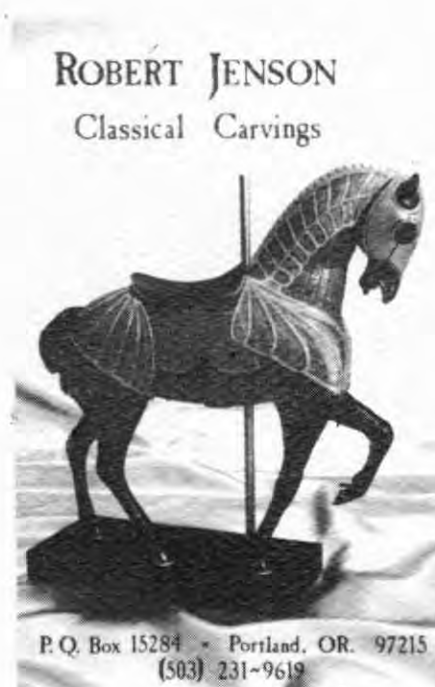
Opinions expressed in this magazine are not necessarily those of the Publishers. CashMirror limits its liability for errors, inaccuracies or misprints in advertisements, opinion papers and letters to the editor. Advertisers and agencies assume liability for the content of advertising and assume responsibility for any claims arising from advertisements made against the publisher. In case of error, the publisher is responsible only for costs associated with the space occupied by the error.

Results published in the newsletter are from information supplied by clubs and organizers and no responsibility for complete accuracy can be taken.

The CASHMIRROR welcomes

contributions of articles and photographs. If possible type articles in double spacing on one side of the paper.

No responsibility will be taken for material while in transit or in this office, although it will receive maximum care.



REFLECTIONS

By Wendy Paulin

This issue is a reminder to me of "why CashMirror was created". Three years ago it was decided the most important thing we could do for cashmere growers is to put the latest research available on their doorstep every month. This issue is another example of our original vision.

A commitment to "getting good information out" is what keeps me motivated at 11 o'clock at night when I am working and others are sleeping.

This month CashMirror presents Whatawhata Research Centre's, "Heritabilities and genetic correlations from New Zealand Cashmere goats." This paper scientifically tests the hypothesis of several other researchers and explains the results in a simple way. And, it pulls valuable information from many sources and puts it in a format that every grower can use. The bibliography alone may be useful.

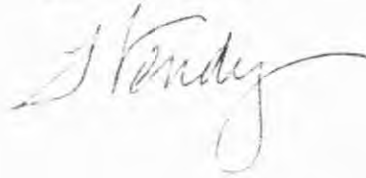
CashMirror gives a special thanks to Whatawhata for permission to print the research paper and for supporting the publication through advertising. It is advertisers like Whatawhata that enable CashMirror to make it to your doorstep every month.

There are many rewards to publishing CashMirror. One of my favorites is to know that this little cashmere magazine has subscribers in some interesting and far-away places. I must tell you, I was surprised when we gained a subscriber in Honk Kong, delighted when Scotland sent in subscriptions, and absolutely astounded to receive a subscription last week from the new Russia.

Another reward for working this hard is comments, pictures, and information we get from readers. Please, when you have questions about an article - let us know. When you disagree, agree, or have another point of view - please share. I know all too well how difficult it is find time to write, but believe me the rewards are there in return. After all, it was the response to a reader's inquiry that brought Dr. Barry Restall and Dr. Bill Pattie to the "Step in the Right Direction" seminar in 1990.

Good cashmere research is limited. Therefore, sharing a cashmere question or experience from home on the farm can be as valuable as the extensive research paper presented in this issue.

Cashmerely yours,



****SUBSCRIBE NOW****

I WOULD LIKE TO SUBSCRIBE TO
CASHMIRROR

Name _____

Address _____

City _____

State _____

Zip _____

Phone _____

FAX _____

SUBSCRIPTION RATE: \$15.00 PER YEAR
(12 ISSUES)

CASHMIRROR PUBLICATIONS
P.O. BOX 639
TOLEDO, WASHINGTON 98591



Genetic Parameters from Cashmere Goats

WHATAWHATA RESEARCH CENTER
Private Bag, Hamilton, New Zealand

*Reprinted with kind permission
from Whatawhata Research
Center, New Zealand.*

Paper for : Livestock
Production Science

M.L. Bigham
C.A. Morris*
B.R. Southey*
R.L. Baker*

*Ruakura Agricultural Center,
Private Bag, Hamilton, New
Zealand

ABSTRACT

Data was obtained at Whatawhata on the growth of goats to the yearling stage and on their cashmere production as hoggets. There were 884 animals recorded from the 1985 to 1989 birth years, comprising the progeny of 60 sires. Records from kid shearings were also obtained in the last two years. Traits included three live weights (birth, weaning and yearling) and fleece weight, yield of down, weights of down and of guard hair, down fiber diameter (mean and standard deviation), and down length at three sites on the live animal before shearing. Mixed-model restricted maximum likelihood (REML) analyses were fitted, with fixed effects representing year of birth, age of dam, sex of kid, birth-rank and date of

birth (and 2-way interactions when appropriate) and with sire of kid as a random effect. Heritabilities from yearling fleece records were 0.42 ± 0.13 for fleece weight, 0.57 ± 0.15 for yield, 0.62 ± 0.15 for down weight, 0.35 ± 0.12 for guard hair weight, 0.99 ± 0.19 for down fiber diameter and 0.57 ± 0.15 for mean down length; corresponding data from kid fleeces (23 sires only) were 0.14 ± 0.06 , 0.19 ± 0.07 , 0.20 ± 0.07 , 0.04 ± 0.04 , 0.19 ± 0.07 and 0.87 ± 0.29 , smaller (in most cases) than the heritabilities for traits from yearling fleeces from the same sire groups. The phenotypic and genotypic correlations between down weight and fiber diameter in yearlings were 0.50 ± 0.03 and 0.81 ± 0.08 respectively, representing an unfavorable relationship when selecting for heavier but finer down. The genetic correlations of yearling weight with down weight and down fiber diameter were slightly negative (-0.34 and -0.25), but the estimates were non-significant.

keywords: goats, cashmere, heritability, genetic correlation, down length, down diameter, fleece weight, down yield.

INTRODUCTION

Cashmere is the down fiber or

undercoat produced by the secondary follicles of the goat *Capra hircus*, in particular the domesticated goat *C. hircus Langier*. There is no specific breed of cashmere goat and many types grow this fiber. The cashmere that is exported from New Zealand Australia is produced by goats derived from feral stock (Pattie et al. 1990). In contrast to the traditional hand combing, the down is harvested by shearing the animal. The down is then separated from the guard hair or outercoat. Normally down consists of 15 to 50% of the total fleece weight.



MARREMA PUPS NOW AVAILABLE

The Farm
P.O. Box 639
Toledo, Wa 98591
Phone: 206-864-4200
Fax: 206-8624-4201

There have been relatively few published reports on cashmere production and breeding (Millar 1986; Pattie et al. 1990). The available data on the inheritance of cashmere, reviewed by Pattie et al. (1990), come from one New Zealand and three Australian studies. The only New Zealand study reported until now has used data obtained from a sire reference scheme supported by central performance tests and progeny testing initiatives (Baker et al. 1991). The Australian studies are from one specifically designed experiment (Pattie and Restall 1985, 1989; Restall and Pattie 1989; Restall et al. 1985), and two commercial breeding herds (Couchman and Wilkinson 1988; Gifford et al. 1990).

The objective of this study is to provide a more detailed

analysis of data on the inheritance of liveweight and fiber traits in the New Zealand cashmere goats.

MATERIALS AND METHODS

Animals and Management

The experiment was carried out at Whatawhata Research Center, Hamilton, and the data reported here represent the first 5 years of recording (kids born in 1985-89). A flock of 300 feral does was assembled from a variety of sources prior to the first matings in autumn 1985, and does were allocated at random within age groups to feral bucks in 15 single-sire mating groups. Each subsequent year, does were re-allocated at random within age groups to single-sire mating groups, and new rising-2-year-old does

(when available) were also allocated to sires at random. The numbers of mating groups used in subsequent years were 15, 9, 9, and 15 respectively, a total of 63 over 5 years (60 unique sires, as described below). Five other bucks were also used, but left insufficient progeny for inclusion in this analysis (2 each in 1985 and 1986 and 1 in 1989). Two bucks were repeat-mated across years; one provided a common link between the 1987 and 1989 birth years, and the other between the 1987, 1988 and 1989 birth years. Bucks used in 1985 were of feral origin, but selected as having some cashmere down in the fleece, but no fleece date were available for these bucks. In 1986 bucks used were industry sires standing at N.Z. Artificial Breeding Centers. In 1987 to 1989 bucks used were from a central performance test in which a random sample of bucks on test were selected for progeny testing each year (Bigham and Baker, 1990), together with two reference sires from the N.Z. Cashmere Sire Referencing Scheme. Three further bucks in 1989 were from the cashmere single-trait selections study under way at the Whatawhata Research Center, with one buck from each of the three lines being used (higher down weight, higher live weight and finer down diameter).

Does kidded in one management group each year and kids were identified to dam and weighed at birth. Weaning was at about 4 months of age. A weaning

CASHMIRROR CLASSIFIED ORDER BLANK PRECEDING ISSUE DATE		
Please publish _____ words ad for _____ time(s) starting with the _____ issue. \$0.50 a word		
SEND CHECK OR MONEY ORDER TO: CASHMIRROR, P.O. BOX 639 TOLEDO, WA 98591		

CASHMIRROR 1991 ADVERTISING RATES DISPLAY ADVERTISING	
AD SIZE	PRICE
Full Page	\$125
1/2 Page	\$75
1/4 Page	\$45
Business Card	\$25
Other display ads \$15 per Column inch, Typeset, extra. Deadline: 8th of month Preceding issue date	
PAYMENT MUST ACCOMPANY ALL ADS UNLESS YOU HAVE ESTABLISHED CREDIT WITH US.	
SEND CHECK OR MONEY ORDER TO:	
CASHMIRROR P.O. BOX 639 TOLEDO, WA 98591	

weight was taken on kids in all years except the first. Kids were managed in one grazing group per sex from weaning until 12 months of age, and a yearling weight was then recorded.

In the 1988 and 1989 crps all kids were shorn in the following February and their fleeces were weighed. At yearling shearing in July each year fleeces were weighed. Just prior to kid or yearling shearings, down lengths were measured on each animal at three sites: the neck, the midside and the rump, using the techniques described by Pattie et al. (1984).

Fleece measurements and calculations

All fleeces were subsampled after shearing using a grid sampling technique with approximately 10 g samples collected. All samples from the animals born in 1985 were sent to the Australian Wool Testing Authority where they were dehaired through a Shirley Analyzer, and yield of down fiber calculated. The dehaired down was then returned to the Whatawhata Research Center where the samples were minicored for measurement of fiber diameter and its standard deviation on the Fiber Distribution Analyzer (FDA) (Lynch and Mitchie, 1976) with 1000 fiber snippets measured on each sample. The samples from animals born in 1986 to 1989 were tested by the Whatawhata Fiber Test Center, using a Shirley Trash Separator

The American Minor Breeds Conservancy



Join the conservation effort to save livestock breeds facing extinction in North America. Over 100 breeds of horses, cattle, sheep, goats, swine and poultry are now at risk. Annual membership of \$20 includes the bimonthly *AMBC News*.

AMBC • Box 477 • Pittsboro, NC 27312 USA • 919/542-3687

(Couchman and Holt, 1990) to determine down yield, and the FDA to measure down diameter and its standard deviation, with again 1000 fiber snippets being measured.

The total weight of down in each fleece was then calculated as follows:

Down weight (g) = Fleece weight (g) x Yield (%) / 100

The weight of guard hairs in the fleece was then calculated as:

Guard hair weight (g) = Fleece weight (g) - Down weight (g).

Traits analyzed

The following traits were analyzed and their

acronyms are shown below:

1. BWT birth weight
2. WWT weaning weight
3. YWT yearling weight
4. FWT fleece weight
5. YLD % yield of down
6. DWT down weight
7. HAIR guard hair weight
8. FD fiber diameter of down.
9. FDSD standard deviation of fiber diameter.

10. DLN down length - 'neck'
11. DLM down length - midside
12. DLR down length - rump
13. DL down length - average of the three .

Traits 4 to 13 were measured on kids in 1988 and 1989, and on yearlings in all years.

Data analysis

Preliminary least squares analyses were fitted to all traits using Genstat (1988), using fixed effects models with year of birth, sex of kid, birth rank (single, multiple) and age of dam, with date of birth as a covariate. Models were fitted with and without 2-way interactions, to test for their statistical significance and importance (% of the sums of squares accounted for). A univariate restricted maximum likelihood (REML) analysis (Meyer 1986) was applied to each trait, using a mixed model with sire of kid (random effect) and with main effects and interactions (fixed effects) as indicated from the preliminary Genstat analyses. Heritability estimates were obtained from the univariate REML models. Subsequently multi-variate REML analyses were carried out on the live

weight traits, then the yearling fiber traits, and then on both groups combined, in order to obtain genetic and phenotypic correlations, as well as further estimates of the heritabilities. The guard hair variate was excluded from the fiber analyses because of the part-whole nature of the set of variates: down weight, guard hair weight, and fleece weight. However, genetic and phenotypic correlations were also analysed between down weight, guard hair weight, average down length and fiber diameter, for which part-whole correlations were not relevant.

For the four traits of likely greatest interest to goat farmers at present (yearling fleece weight, down weight, down yield and down diameter), further heritabilities were estimated from 1985 and 1986 and 1989 data only, to be combined with corresponding estimates published by Baker et al. (1991). Their estimates come from the New Zealand cashmere sire references analyses of data from industry flocks, and the Whatawhata data from 1987 to 1988. The heritability estimates were combined by weighting them according to the reciprocal of their standard errors.

RESULTS AND DISCUSSION

Production Levels

Table 1 presents the numbers of animals, the overall means and the phenotypic standard deviations for all traits measured for the kids (5

months of age) and yearlings (10 months of age). A feature of these results is the large phenotypic standard deviations for all fleece traits except down diameter. This indicates that there is considerable phenotypic variation present between animals as has also been reported for the Australian cashmere producing goat (Pattie and Restall, 1987; Restall and Pattie, 1989); the Scottish feral goat (Russel and Bishop, 1990) and the Asian and Soviet Union cashmere producing goats (Millar, 1986).

Environmental Effects

Table 2 presents the effects of dam age (2 years versus 3-6 years of age), sex (male versus female), birth rank (single versus multiple born) and date of birth on liveweights and fleece traits. Age of dam had a significant effect ($P < 0.01$) on birth weight only. Gifford et al. (1989) reported that kids born to young dams (1 and 2 years of age) and older dams (6+ years) tended to be lighter as yearlings than those from 3 or 4-year-old dams.

Age of dam also had significant effects on fleece wight and down weight.

Male progeny were significantly ($P < 0.01$) heavier at birth, weaning and as yearlings and had a significantly ($P < 0.001$) heavier total fleece, which had significantly ($P < 0.001$) more hair. This greater weight of hair in the fleece of males accounts for the difference in fleece weight between the sexes. Females, therefore, had a significantly ($P < 0.05$) higher yield of down in the fleece and the down was longer ($P < 0.001$). Both Restall and Pattie (1989) and Gifford et al. (1989) have reported no differences in down wight and down diameter between sexes.

Birth rank had a significant effect ($P < 0.001$) on all liveweights, with single-born animals being heavier. Single-born animals had significantly ($P < 0.05$) higher down yields than multiple-born animals, which resulted in slightly more down in the

MISSOURI FARM™

There is a farm magazine
for small farmers and
small-acreage landowners!



MISSOURI FARM is the magazine for today's small farmer and small-acreage landowner. It features how-to articles about alternative crops, high-value vegetable and small fruit crops, aquaculture, exotic/minor breeds of livestock, marketing, home-based business, beekeeping, gardening, rural living and more. For more information on high-value crops and diversification on your small farm, subscribe to MISSOURI FARM today!

Yes, I'd like to subscribe to Missouri Farm
☐ 1 yr. \$18 ☐ 2 yrs. \$33 ☐ 3 yrs. \$45

Name _____

Address _____

Town _____

State _____ Zip _____

Amount Enclosed \$ _____

Clip and mail to:
Missouri Farm
Rt. 1, Box 237
Clark, MO 65243

fleece, but fleeces had down of similar diameter. Restall and Pattie (1989) and Gifford et al. (1989) have both reported that single-born animals were heavier and had more down and coarser down as yearlings than multiple-born animals.

Date of birth had a significant ($P < 0.001$) effect on liveweights, total fleece weight and weight of hair in the fleece. The earlier born kids were heavier as yearlings and had more hair in the fleece. The greater weight of hair in the fleece accounted for the differences in total fleece weight of down. Restall and Pattie (1989) reported that earlier born kids were heavier and had more down in the

fleece as yearlings than later born animals while Gifford et al. (1989) reported that early and late kids had a similar weight of down in the yearling fleece, but the down was coarser from early-born kids.

The above indicates that environmental factors are important sources of variation for yearling liveweight and fleece traits, and should therefore be taken into account when selecting replacement animals for the breeding flock. The actual environmental correction factors from these three studies are given in Table 3 and show that the differences between the three studies are small but that corrections

should be made to yearling liveweight and down weight for birth rank and dam age, with a further correction to yearling liveweight for date of birth. As selection usually takes place within each sex group, no adjustments for sex will be necessary.

Heritabilities

Univariate heritability estimates and standard errors for all kid and yearling traits are given in Table 4. The estimates were higher for traits in yearlings than for traits in those same animals as kids. No heritability estimates for kid traits have previously been published, but the present estimates indicate that



Glacier Cashmere

Classic Style, Superfine

*Miriam Jeswine
81811 Lost Creek Road
Dexter, Oregon 97431
(503) 937-2253*

TWO FINE YOUNG BUCKS FOR SALE

PREMIER #SBIR 29

White/white, born March 31, 1991

Sire: Greenmount King Billy 7601 MFD: 17.4 at 28 months, long dense fleece.

Dam: Yarrum Rowella 834 MFD: 16.14 at 10 months

BANJO #SBIR 27

Tan/white, born April 1, 1991

Sire: Greenmount Banjo MFD: 17.42 at 26 months

Dam: Maitland Brenda 24 MFD: 16.61 at 18 months

Cashmere Breeding Stock

U.S.D.A. - S.B.I.R. Research Test Farm

Maremma Livestock Guardian Dogs

genetic gain resulting from selection in kids is likely to be slower than that from selection in yearlings, given that the phenotypic standard deviations for the kid parameters are similar to those of the yearlings.

The yearling heritability estimates based on all 60 sire progeny groups indicate that all fleece traits except fiber diameter are moderate to high. These estimates are similar to those previously reported by Pattie and Restall (1989), Couchman and Wilkinson (1987), Gifford et al. (1989) and Baker et al. (1991) with the exception of down diameter. The range in value for down diameter previously reported is from 0.32 to 0.79 and the present estimate of 0.99 ± 0.19 does not differ significantly from that of Gifford et al. (1989) 0.70 ± 0.19 , or Baker et al.

(1991) of 0.79 ± 0.23 . The estimates of Baker et al. (1991) are from the New Zealand Cashmere sire reference scheme and include the 1987 and 1988 data from the present data set. It is possible to combine all the data from Baker et al. (1991) with the data in this study and the combined heritability estimates are given in Table 5. Also shown are estimates from the 1985, 1986, and 1989 data in the present analysis and those of Baker et al. (1991). These combined estimates are similar to those shown in Table 4. Baker et al. (1991) pointed out concerns in New Zealand about the reliability and relevance of the relatively high Australian heritability estimates (Pattie and Restall, 1989; Gifford et al., 1989), particularly those for down weight and diameter. It is therefore reassuring that the

New Zealand and Australian estimates were similar. It can thus be concluded that there is considerable scope for genetic improvement of the important Cashmere traits because of these high heritabilities and the large phenotypic standard deviations for fleece traits.

The heritability estimates for liveweights were all low, with the yearling estimate being similar to those reported for cashmere goats by Pattie and Restall (1989) and Gifford et al. (1989) and for Angora goats (Gifford et al., 1987; Nicoll, 1987; Nicoll et al. 1989).

Genetic and Phenotypic Correlations

Table 6 presents the genetic and phenotypic correlations for all yearling fleece traits, while Table 7



THE *Exotic* DIRECTORY

AN ANIMAL BUYERS' GUIDE & TRADE DIRECTORY

- ★ NAMES/ADDRESSES/PHONE NUMBERS
Breeder, Farmers, Hobbyists, Dealers of Exotics
- ★ CALENDAR OF SALES & EVENTS
- ★ PUBLICATIONS-SUPPLIERS-SERVICES
- ★ FREE TO LIST ★ OVER 225 PAGES

☐ Send Me A Directory - \$29.95 Enclosed
 Rt. 5, Box 35A, Lamar, MO 64759 — 417/682-6106

1992 Advertising & Orders

1-800-821-4619

presents the genetic and 3phenotypic correlations between liveweights and all yearling fleece traits.

Pattie et al. (1990), Ponzoni and Gifford (1990) and Baker et al.

(1991) have all stated that the three most important traits for maximizing financial returns from cashmere goats are yearling liveweight, down weight and down diameter.

The genetic correlations between yearling liveweight and down weight and down diameter are slightly negative, as has previously been reported by Pattie and Restall (1989), Gifford et al. (1989) and Baker et al. (1991).

Similarly, there is a strong positive genetic correlation between down weight and down diameter, consistent with most previous reports. The exception was Gifford et al. (1987) who reported a weak positive correlation (0.04 ± 0.23). That the genetic correlation between down weight and diameter was positive and moderately high was confirmed by Restall and Pattie (1990) from realized genetic correlations calculated following divergent selection for down weight and diameter in

separate sets of selection lines. Realized genetic correlations (across lines) between down weight and diameter varied from 0.45 to 0.62, with an average of 0.53.

Total fleece weight is partitioned into its two components of guard hair and down fiber by use of down yield, which in turn is

calculated from a subsample of the whole fleece being separated into guard hair and down. The costs of determining yield of down are high and because of that there is need to determine alternative ways of estimating down weight. Gifford et al. (1990) have suggested that because there is a strong genetic correlation between total fleece weight and down weight, fleece weight could be

used as a predictor of down weight. Since down weight is calculated from total fleece weight and down yield, there are automatic "spurious" positive correlations between these traits. In the present study the relationships among down weight, hair weight, down fiber diameter and down length were calculated in multivariate analyses. The resulting heritability estimates for down weight, fiber



Orbie and Dora Mullins
3457 State Highway 508
Onalaska, WA 98570
(206) 978-6573 • (206) 864-6571

diameter and down length were similar to those of the univariate analyses (Table 4) and the genetic and phenotypic correlations among all traits similar to those in the multivariate analyses (Table 6). This further supports the conclusion that total fleece should not be used as a predictor of down weight.

There was a strong positive genetic correlation between down length and down weight (0.92 ± 0.06) as also reported by Pattie and Restall (1989) and Pattie et al. (1990). Thus, down length can be used as predictor of down weight. Down length is easy to measure on the animal prior to shearing and can therefore greatly reduce the costs of estimating down yield.

A complete breeding program would also include some measure of reproductive performance such as number of kids weaned per doe mated. Bigham (1990) has, however, stated that for many New Zealand Cashmere flocks reproductive performance is currently not being considered as a selection criterion, as flock masters consider that this is a present at a satisfactory level. This may, however, change in future and there is a need to establish the relationships between reproductive performance, liveweight and fleece traits.

Conclusions

The heritability estimates for down weight, down diameter and down length confirm

those previously published for the Australian cashmere producing goat (Pattie et al., 1990) and indicate that there is considerable scope for genetic improvement. Genetic antagonisms are present such that selection for increased down weight will lead to a slight reduction in liveweight and an increase in down diameter, both undesirable responses. Restricted selection indexes could be utilized to prevent these undesired responses, but typically such indexes reduce the potential rate of genetic gain. Bigham and Baker (1991) have, however, reported that in many New Zealand cashmere flocks yearling down diameter is approaching a level where a restriction will have to be placed on it if the mixed-aged doe flock is to continue to produce fiber in the cashmere range, i.e. less than 18.5 micron. This is because down diameter increases from the yearling stage to the 3-year-old by approximately 2.0 micron (Pattie and Restall, 1989; Gifford et al., 1989; Bigham et al., unpublished).

Because of the strong genetic correlation between down length and down weight, down length can be used as an indirect measure of down weight in selection programs. Pattie and Restall (1989) have shown that good breeding value estimates for down weight can be obtained indirectly from down length and liveweight or down length alone, with little reduction in accuracy compared with direct selection for down weight.

Use of down length can therefore lead to a reduction in costs, as it is easy to measure on the animal prior to shearing, whereas down yield and hence down weight is difficult and expensive to obtain.

The data present no alternatives for indirect measurement of down diameter. The strong positive genetic correlation between down weight and diameter indicates that some restriction on the increase in down diameter will have to be applied in a selection program aimed at increasing down weights. This implies that down diameter should be measured accurately so that efficient selection indexes can be constructed to limit its increase.

ACKNOWLEDGEMENT

The skilled technical assistance of Jane Stewart, Aprile Kellick, Gerard Poff, Bob Goodwin and Margaret Scott is greatly appreciated.



REFERENCES

- Baker, R.L., Southey, B.R., Bigham, M.L. and Newman, S-A.N., 1991. Genetic parameters of New Zealand cashmere goats. *Proc. N.Z. Soc. Anim. Prod.* 51: (in press).
- Bigham, M.L., 1990. The genetics of goat fiber production. In "Goat Health and Production". Post Graduate Committee in Veterinary Science, Sydney University, pp 31-45.
- Bigham, M.L. and Baker, R.L., 1990. Central performance testing of Angora and Cashmere bucks in New Zealand. In "Goat Health and Production:.. Post Graduate Committee in veterinary Science, Sydney University, pp 47-57.
- Couchman, R.C. and Wilkinson, J.L., 1987. Genetic estimates for commercial Cashmere traits. 2nd International Cashmere Conference, Lincoln, New Zealand, pp 68-83.
- Couchman, R.C. and Holt, C.M., 1990. A comparison of the Shirley Analyser and the Shirley Trash Separator for achieving Cashmere Samples. *Journal of the Textile Institute*, 81: 141-155.
- Genstat, 1988. Statistical Package: Genstat 5, Release 1.3. Lawes Agricultural Trust (Rothamsted Experimental Station, U.K.).
- Gifford, D.R., Ponzoni, R.W., Ellis, N.J.S., Levinge, F.C.R. and Milne, M.L. 1989. Phenotypic and genetic parameters for production characteristics of cashmere goats in South Australia. *Proc. 3rd Int. Cashmere Conf.*, Adelaide.
- Gifford, D.R., Ponzoni, R.W., Ellis, N.J.S., Levinge, F.C.R. and Milne, M.L., 1990. Genetic parameters for production characteristics of Australian cashmere goats. *Proc. Australian. Association of Animal Breeders and Genetics.*, 8: 461-465.
- Lynch, L.T. and Mitchie, W.A., 1976. An instrument for the rapid automatic measurement of fiber fineness distributions. *Textile Research Journal*, 46: 653-660.
- Meyer, K., 1986. Restricted maximum likelihood for data with a hierarchical genetic structure. *Proc. 3rd. Wld. Cong. on Genet. appl. to Livest. Production.*, 12: 397-402.
- Millar, P., 1986. The performance of Cashmere goats. *Animal Breeder Abstract.*, 54: 181-199.

- Nicoll, G.B., 1987. Genetic parameters and selection policies for fiber characteristics in goats. Proc. Sheep and Beef Cattle Society. New Zealand Veterinary Association 17th Seminar, Hamilton, New Zealand, pp 38-50.
- Nicoll, G.B., Bigham, M.L. and Aladerton, M.J., 1989. Estimates of environmental effects and genetic parameters for liveweight and fleece traits of Angora goats. Proc. N.Z. Soc. Anim. Prod., 49: 183-190.
- Pattie, W.A., Restall, B.J. and Smith, G.A. 1984. The measurement of Cashmere production by Australian feral Goats. Proc. Aust. Soc. Anim. Prod., 15: 525-528.
- Pattie, W.A. and Restall, B.J., 1985. Selection objectives for feral goats. Proc. Aust. Assoc. Anim. Breed. and Genet. 4:269-272.
- Pattie, W.A. and Restall, B.J., 1987. Breeding Cashmere in Australian feral goats. Proc. 2nd Intern. Cashmere Confl, Lincoln, New Zealand, pp 51-67.
- Pattie, W.A. and Restall, B.J., 1989. The inheritance of Cashmere in Australian goats.
2. Genetic parameters and breeding values Livest. Prod. Sci., 21:251-261.
- Pattie, W.A., Baker, R.L., Nicoll, G.B. and Restall, B.J. 1990. Breeding for Cashmere and Mohair. Proc 4th World Cong. on Genetics Applied to Livestock Production 15: 167-176.
- Restall, B.J., Pattie, W.A. and Winters, J.D., 1985. Genetic parameters for production characteristics of Australian feral goats. Proc. Aust. Assoc. Anim. Breed. and Genet., 4:265-268.
- Restall, B.J. and Pattie, W.A., 1989. The inheritance of Cashmere in Australian goats.
1. Characteristics of the base population and the effects of environmental factors. Livest. Prod. Sci., 21: 157-172.
- Russel, A.J.F., and Bishop, S.C., 1990. Breeding for cashmere in feral and imported goats in Scotland. Proc. 4th Wld. Cong. on Genet. Appl. to Livest. Prod. 15:205-208.

Goats & Hooves
Exotic Animals & The Marketplace
 Bi-Monthly Digest

Dept 63, Rt. 3 Box 65, Chandler,
 OK 74834 Samples - \$2.00
 All foreign subscriptions must be payable
 in U.S. Funds on a U.S. Bank

•\$16 yr USA •\$22 yr Canada •\$30 yr Others

ANIMALS
 EXOTIC and SMALL

Featuring
 All Animals
 Exotic and Non-Exotics

Subscribers throughout the
 United States and Canada
 Featuring: How-To-Articles,
 vet information, breed history,
 ways to supplement your income
 and more!

1320 Mountain Ave
 Norco, CA 91760
 (714) 371-4307
 24 Hour Fax
 (714) 371-4779

Annual Subscriptions
 \$15.00 U.S. • \$25.00 Outside U.S.
 Sample Issue \$2.50

TABLE 1

Number of records, overall mean and phenotypic standard deviation (SD) for each trait

Trait	Kid			Yearling		
	Number	Mean	SD	Number	Mean	SD
Live weights						
BWT, kg	884	2.4	0.41			
WWT, kg	637	11.8	2.10			
YWT, kg				503	16.3	2.51
Fleece traits						
FWT, g	266	91.7	43.0	814	216	51.8
YLD, %	270	36.6	16.7	812	32.7	11.0
DWT, g	266	36.5	32.5	808	71	32.5
HAIR, g	266	55.2	23.0	808	145	41.8
FD, μm	270	15.1	1.18	806	15.8	1.19
FDSO, μm	270	4.2	1.16	807	4.0	1.34
DLN, mm	271	19	26.1	815	61	20.6
DLM, mm	271	32	24.1	815	57	18.6
DLR, mm	271	29	21.2	815	43	16.5
DL, mm	271	27	21.8	815	54	16.7

TABLE 2

Effects of age of dam, sex of kid, birth rank (single or twin) and date of birth covariate on weight and hogget fleece traits

Trait	Age of dam(yr)		Significance test								
	2	>2	Female	Male	Single	Twin	Date of birth	Dam Age	Sex	Rank	Birth date
Live weights											
BWT, kg	2.27	2.44	2.30	2.56	2.64	2.32	0.07±0.001	***	***	***	***
WWT, kg	11.52	11.81	10.88	12.89	13.01	11.22	-0.05±0.01	ns	***	***	***
YWT, kg	16.16	16.12	13.66	19.39	16.63	15.87	-0.06±0.01	ns	***	**	***
Fleece traits											
FWT, g	207	217	208	224	216	215	-0.46±0.15	ns	***	ns	**
YLD, %	32.3	32.8	33.7	31.7	34.0	32.2	0.04±0.03	ns	*	*	ns
DWT, g	66	70	71	69	73	68	-0.08±0.09	ns	ns	+	ns
HAIR, g	140	144	136	153	142	145	-0.42±0.11	ns	***	ns	***
FD, μm	15.86	15.73	15.71	15.79	15.74	15.75	0±0	ns	ns	ns	ns
FDSD, μm	4.00	4.01	4.09	3.92	4.11	3.96	0±0	ns	+	ns	ns
DLN, mm	61.5	60.9	64.1	59.9	62.0	60.5	0.02±0.06	ns	**	ns	ns
DLM, mm	57.6	57.1	60.4	55.5	58.0	56.8	-0.00±0.05	ns	***	ns	ns
DLR, mm	43.4	43.4	46.6	41.1	44.1	43.0	0.02±0.05	ns	***	ns	ns
DL, mm	54.2	53.8	57.0	52.1	54.7	53.4	0.01±0.05	ns	***	ns	ns

TABLE 3

Environmental correction factors for yearling liveweight and fleece traits from the present data and those of Gifford et al. (1989) and Restall and Pattie (1989).

		YWT,	FWT,	YLD,	DWT,	FD,	DL,
		kg	g	%	g	μm	mm
Birth Rank (Single minus multiple)							
Source	1	0.8**	1.0	1.8*	5.0	0.0	1.3
	2	1.5*	16.6*	-1.0	4.8*	0.2	
	3	2.3*	22.0	2.0	9.3*	0.4	4.0
Sex (Male minus female)							
Source	1	5.7***	16.0***	-2.0*	-2.0	0.1	-4.9***
	2	3.1*	25.4*	-2.7*	3.8	0.0	
	3	3.0**	10.0**	0.7**	3.1	0.0	0.0
Dam Age (3 to 5 yr minus 2 yr)							
Source	1	0.0	10.0	0.5	4.0	-0.1	-0.4
	2	1.2*	26.5*	-1.2	12.0*	0.1	
Date of Birth (Covariate, per day)							
Source	1	-0.06***	-0.46**	0.04	-0.08	0.00	0.01
	2	-0.05***	-0.13	0.01	-0.02	-0.01***	

(* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$)

Source 1 Present data

2 Gifford et al. (1989)

3 Restall & Pattie (1989)

TABLE 4

Univariate heritability (h^2) estimates and standard errors (s.e.) for each trait in kids and yearlings

Trait	Kid		Yearling		Yearling	
	(1988 and 1989)		(1988 and 1989)		(1985-89)	
	h^2	s.e.	h^2	s.e.	h^2	s.e.
<u>Live weights^a</u>						
BWT	0.21	0.10				
WWT	0.20	0.11				
YWT					0.39	0.16
<u>Fleece traits</u>						
FWT	0.14 ^b	0.06	0.44 ^b	0.22	0.42	0.13
YLD	0.19	0.07	0.92	0.30	0.57	0.15
DWT	0.20	0.07	0.76	0.27	0.62	0.15
HAIR	0.04	0.04	0.55	0.24	0.35	0.12
FD	0.19	0.07	0.78	0.28	0.99	0.19
FDSD	0.38	0.09	0.87	0.29	0.49	0.14
DLN	0.48	0.23	0.66	0.26	0.61	0.15
DLM	0.90	0.30	1.00	0.31	0.55	0.15
DLR	0.89	0.30	0.65	0.25	0.26	0.11
DL	0.87	0.29	0.92	0.30	0.57	0.15

^a Number of sires over 5 years = 60

^b Number of sires over 2 years (1988 and 1989) = 23

TABLE 5

Heritability (h^2) estimates for all New Zealand data combined across years

Trait	This analysis,		Baker et al.			
	<u>1985, 1986, 1989 only</u>		<u>(1991) data</u>		<u>Combined</u>	
	h^2	s.e.	h^2	s.e.	h^2	s.e.
WWT	0.22	0.13	0.14	0.10	0.17	0.08
YWT	0.42	0.21	0.22	0.15	0.29	0.12
FWT	0.43	0.13	0.31	0.14	0.38	0.10
YLD	0.65	0.16	0.64	0.21	0.64	0.13
DWT	0.68	0.16	0.57	0.19	0.63	0.12
FD	1.01	0.19	0.82	0.23	0.93	0.15

LAMBORGHINI

SAME

MITSUBISHI

M & W ENTERPRISES

Sales and Services
103 Cowlitz Street
Toledo, Washington 98591
206-864-6571

WE SHIP PARTS ANYWHERE

GOULDS
WATER PUMPS

STIHL
CHAIN SAW

LELAND

ZETOR

TAARUP

WOODS

DIXON

KVERNELAND

LEYLAND

KUHN

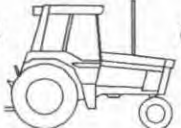


TABLE 6

Heritabilities (multivariate analysis) and phenotypic and genetic correlations^a for yearling fleece traits

Trait	FWT	YLD	DWT	HAIR	FD	FDSD	DLN	DLM	DLR	DL
FWT	0.43	0.10	0.60	0.78	0.37	0.06	0.17	0.31	0.28	0.27
	0.13	0.04	0.03	0.02	0.04	0.04	0.04	0.04	0.03	0.04
YLD	0.43	0.65	0.82	-.52	0.35	0.27	0.42	0.37	0.30	0.41
	0.19	0.16	0.01	0.03	0.04	0.04	0.03	0.04	0.04	0.03
DWT	0.71	0.94	0.68	-.04	0.50	0.27	0.40	0.44	0.37	0.45
	0.11	0.03	0.16	0.04	0.03	0.04	0.04	0.03	0.03	0.03
HAIR	0.62	-.44	-.10	0.33	0.07	-.13	-.11	0.05	0.06	-.01
	0.14	0.18	0.22	0.12	0.04	0.04	0.04	0.04	0.04	0.04
FD	0.69	0.70	0.81	0.07	1.01	0.41	0.25	0.30	0.22	0.28
	0.13	0.11	0.08	0.21	0.19	0.04	0.04	0.04	0.04	0.04
FDSD	0.56	0.76	0.82	-.13	0.79	0.54	0.15	0.13	0.07	0.13
	0.18	0.12	0.10	0.23	0.09	0.14	0.04	0.04	0.04	0.04
DLN	0.53	0.87	0.88	-.23	0.67	0.67	0.65	0.76	0.64	0.90
	0.17	0.08	0.07	0.22	0.12	0.14	0.16	0.02	0.02	0.01
DLM	0.58	0.86	0.90	-.06	0.80	0.85	0.94	0.57	0.76	0.93
	0.16	0.09	0.07	0.24	0.10	0.11	0.04	0.15	0.02	0.01
DLR	0.57	0.87	0.91	-.20	0.75	0.95	0.89	0.98	0.31	0.87
	0.19	0.11	0.09	0.26	0.13	0.08	0.08	0.04	0.11	0.01
DL	0.56	0.89	0.92	-.12	0.75	0.83	0.97	0.99	0.97	0.60
	0.17	0.08	0.06	0.23	0.10	0.11	0.02	0.01	0.03	0.15

^a Heritabilities on the diagonal; phenotypic correlations in the upper triangle and genetic correlations in the lower triangle. The parameter estimate is given on the first and its standard error on the second of each pair of rows.

TABLE 7

Genetic (G) and phenotypic (P) correlations between yearling fleece traits and live weight traits

	BWT ^a		WWT ^b		YWT ^c	
	G	P	G	P	G	P
FWT	-.25 ^d	0.15	0.30	0.17	0.27	0.33
	0.30	0.04	0.35	0.04	0.33	0.05
YLD	-.15	0.02	-.01	-.14	-.22	-.10
	0.27	0.04	0.34	0.04	0.32	0.06
DWT	-.18	0.11	0.10	-.02	-.34	0.09
	0.27	0.04	0.34	0.04	0.34	0.06
HAIR	-.15	0.10	0.18	0.22	0.46	0.35
	0.31	0.04	0.34	0.05	0.29	0.05
FD	-.03	0.04	0.00	0.06	-.25	0.13
	0.25	0.04	0.31	0.05	0.33	0.06
FDSD	0.03	-.02	0.01	-.11	-.40	-.10
	0.27	0.04	0.38	0.04	0.34	0.06
DLN	0.22	0.00	0.23	0.00	-.29	-.05
	0.25	0.04	0.33	0.04	0.33	0.06
DLM	-.04	0.04	0.22	0.06	-.19	0.06
	0.26	0.04	0.32	0.04	0.33	0.06
DLR	0.04	0.04	0.00	0.00	-.31	0.02
	0.30	0.04	0.43	0.43	0.34	0.06
DL	0.09	0.03	0.18	0.02	-.32	0.00
	0.26	0.04	0.33	0.04	0.31	0.06

^a 769 animals with 60 sires

^b 577 animals with 45 sires

^c 365 animals with 42 sires

^d The parameter estimate is given on the first and its standard error on the second of each pair of rows.



BREEDERS DIRECTORY

ARIZONA

CHIVO NEGRO

DW Cox
RR 1, Box 37 EE
Elfrida, Az 85610
602-824-3661

CALIFORNIA

ROCKY MOUNTAIN

CASHMERE

Laura Oberfeld
P.O. Box 21
Potter Valley, Ca 95469
707-743-1148

ARBORETUM FARMS

Joe and Susan Tooker
Star Route Box 16B
Capay, California 95607
415-843-0744

FURRY DOWN FARM

Beverly Rolfe & Rolf
Pinkwart
14254 Oak Ridge Road
Penn Valley, CA 95946
916-273-7653

PETALUMA OSTRICH FARM

Greg Gibson
5084 Lakeville Hwy
Petaluma, Ca 707-778-8303

SUNRISE CASHMERES

Melody and Jeremy Driscoll
P.O. Box 245
Blocksburg, CA 95414
707-926-5430

COLORADO

CANYON COUNTY

CASHMERE

Mesa Creek Star Rt., Box 7
Naturita, Colorado 81422
Cynthia Walton
(303) 862-7214

CASHCO GOATS AMERICA

Jill Darrah
Bronwyn Scheutze
1901 Arapaho Dr.
Longmont, Co 80501
Phone: 303-776-9410
Fax: 303-776-8758

COLORADO CASHMERE BREEDERS

Russ Nelson
Ferris Hamilton
1762 W Fox Farm Road
Larkspur, Colorado 80118
Phone: 303-681-3832
Fax: 303-681-2545

CAPRICORN CASHMERES

Kris McGuire
1115 County Road 45E
Virginia Dale, Co. 80548
Phone & Fax: 303-493-6015

CONNECTICUT

CLASSIC CASHMERE BREEDERS

Peter Sellew
Carol McComiskey
Call Box 7 A
Lebanon, CT 06249
Phone: 203-642-7591
Fax: 203-642-7912
203-642-6965

ILLINOIS

PATRICIA FIORELL

505 S. Queen Anne Rd
Woodstock, Il 60098

MARYLAND

HUNT VALLEY

CASHMERE

Hunt Valley Farms Inc.
6747 Whitestone Rd
Baltimore, MD 21207
1-800-284-3433
Fax: 301 298-3579
Lynn Beattie

MAINE

DOWN EAST CASHMERE

Andree Lawrence
RFD 2, Box 120
Belfast, Me 04915
207-338-2325

CHINA LAKE CASHMERES

Ward Cove Farm
P.O. Box 131
China, ME 04926
207-923-3972
Valerie DuPuy

BLACK LOCUST FARM

Yvonne Taylor
P.O. Box 378
Washington, ME 04574
207-845-2722

BESSEY PLACE CASHMERE

Wes and Marilyn Ackley
RFD #1 Box 2610
Buckfield, Maine 04220
207-336-2948



BREEDERS DIRECTORY

MICHIGAN

STONY LONESOME FARM

Susan Drummond
1451 Sisson
Freeport, MI 49325
616-765-3056

MONTANA

INDIAN TREE FARMS

Christine Maurer
Rt 2, Box 3495
Dutton, MT 59433
406-463-2451

PMF CASHMERE COMPANY

Tom and Ann Dooling
Pioneer Mountain Farm P.O.
Box 1339
Dillon, MT. 59725
Phone: 406-683-5445
Fax: 406-683-5567

NEBRASKA

AIRY KNOLLS FARM, INC.

Richard and Harriet Jensen
RR3, Box 144 Cozad, NE
69130
308-784-3312

JOHN HARRIS

Rt 1 Box 193
Mitchell, NE 69357
308-635-1579

CORNHUSKERS CASHMERE

Randy Hartman
Rt 3, Box 253
Grand Island, NE 68801
308-381-8289

NEVADA

NEVADA CASHMERE GOATS

Star Rt Box 6
Lovelock, NV 89419
(near Orena)
207-273-7409

NEW MEXICO

JANE JASPER

1100 Behnke N.E.
Los Lunas, New Mexico
87031
Phone: 505-865-1880

NEW YORK

STONEHILL FARM

Mary Mathews
422 Mt. Holly Road
Katonah, New York 10536
914-232-9593

NORTH CAROLINA

BLUEBIRD MEADOW FIBERS

Marie Crock
623 Infinity Road
Durham, NC 27712
919-479-5069

OREGON

North West Cashmeres

Carole Laughlin
19025 SW Hillsboro Hwy
Newberg, Oregon 97132
503-628-0256
Tasmanian Stock

A & B CASHMERE

Auggie & Beth Pimentel
P.O. Box 6983
Brookings, Oregon 97415
(503) 469-4548
Fax: (503) 247-6273

CHAMPAGNE CASHMERES

Lisa Faulkner
Adrienne Hochee
64315 Bend Redmond
Highway
Bend, Oregon 97701
503-389-5392

OREGON CASHMERE COMPANY

Joyce & Allen Peterson
20995 NW Bishop Scott Road
Yamhill, Oregon 97148
503-662-4522

GLACIER CASHMERE USDA SBIR TEST FARM

Miriam Jeswine
81811 Lost Creek Road
Dexter, Oregon 97431
503-937-2253

THE EWE AND I (Suffolk Sheep and Cashmere Goats)

3121 Odell Hwy
Hood River, Oregon 97031
503-354-1963

MOUNTAIN LAKE FARM

Susan and Robert Stutz
Rt 1 Box 181
Gaston, Or 97119
503-359-3580
Australian/Tasmanian
Cashmere Goats & AKC
Great Pyrenees



BREEDERS DIRECTORY

**RAINBOW RIDGE
CASHMERE CO. LTD**
1574 Dean Creek Road
Reedsport, Oregon 97467
Phone: 503-271-5514
Fax: 503-457-9911

PENNSYLVANIA

AMITY CASHMERE
Dawn Jernigan
1917A Old Bethlehem Pike
Sellersville, PA 18960
(215)-257-8847

TEXAS

**WILDLIFE
INTERNATIONAL**
Bob Dillard
Box 81
Refugio, Texas 78377
512-526-2977

GOLDEN'S POINT
Larry Golden
Rt 2
Lockney, Texas 79241
806-652-3196

**AMERICAN BREEDERS
CASHMERE CO.**
Don Jackman, Dennis
Funderburgh,
Carroll Vernor
P.O. Box 9 - Hwy. N
Camp Wood, Tx 78833
512-597-6124

CR RANCH
Connie Ross
Star Route A
P.O. Box 764 A
Austin, Texas 78736
512-288-0853

VERMONT

LLC Cashmere
Lydia Ratcliff
RFD #1
Chester, Vermont 05143
802-875-3159

WASHINGTON

**WORLD DESIGN
CASHMERES**
Lori Bialic
Star Route Box 87D
Oroville, Wa 98844
509-485-3600

RAINSHADOW FARM
USDA/SBIR TEST FARM
Marcia Adams
25101 Chris Lane NE
Kingson, Wa 98346
206-297-4485

**CASCADE CASHMERE
COMPANY**
200 Larson Road
Silver Creek, Wa 98585
206-983-3154
Fax: 206-983-3676

THE FARM
USDA/SBIR TEST FARM
Michel Paulin
P.O. Box 639
Toledo, Wa 98591
Phone: 206-864-4200
Fax: 206-864-4201

**BARREL SPRINGS
CASHMERE**
Linda & Steve Pardon
USDA/SBIR Test Farm
143 Barrel Spring Road
Bellingham, Wa 98226
206-724-5371

**WORLD DESIGN
CASHMERES**
Lori Bialic
Star Rt Box 87D
Oroville, Wa 98844
509-485-3600

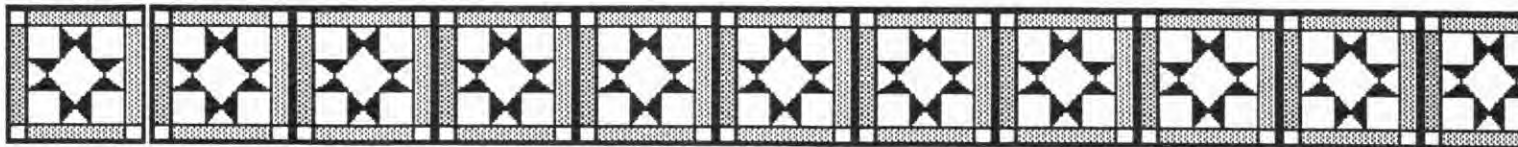
AUSTRALIA

Cashking Cashmere Company
John and Margaret Banks
P.O. Box 333
Forth, Tasmania Australia
7310
Fax: 61-04-231-087

Ceduna Cashmere
Jim and Marg Cooper
Chads Creek Road
Strathewen, Victoria 3099
Australia
Phone: 61-03-714-8214

Greenmount Cashmeres
Tim and Jenny Eddington
RSD Ross Dhu
Selbourne, Tasmania Australia
7292
Phone/FAX: 61-03-966-162

BREEDERS LISTING
\$30.00 per year
P.O. Box 639
Toledo, Wa 98591



CLASSIFIED ADS

PUBLICATIONS

ANGORA GOATS THE NORTHERN WAY

2nd Edition \$15.00

Don and Sue Drummond

1451 Sisson Road

Freeport, Michigan 49325 616-765-3056

CASHMIRROR PUBLICATIONS : back issues of CashMirror. \$3.00 per issue.

P.O. Box 639, Toledo, Wa 98591

"STEP IN THE RIGHT DIRECTION" Seminar notes from CashMirror Publication's 1990 Seminar. Cashmere Inheritance, by Dr. Bill Pattie and Dr. Barry Restall. \$15.00, CashMirror Publications, P.O. Box 639, Toledo, Wa 98591

FLEECE

Buying Raw Fleece: Prefer quality, longer length, clean fiber for spinning. No cashgora. Send information/sample to : Susan/Mountain Lake Farm, Rt 1 Box 181, Gaston, Oregon 97119 (503)359-3580. 10

GUARD DOGS

MAREMMA LIVESTOCK GUARDIAN DOGS

CLUB: Maremma Sheepdog Club of America, 1818 W Bippely, Lake Odessa, MI 48849 616-374-7209. Free information and Breeder Directory

MAREMMA GUARD DOGS: 1 boy and 1 girl born November 30, 1991 available February, Michel Paulin 206-864-4200.

GOATS

Cascade Cashmere Company's semen catalog now available. Ask for yours now. 200 Larson Rd, Silver Creek, Wa. 206-983-3154.

THE FARM CASHMERES, USDA/SBIR Test Farm, Now taking reservations for 1992 kids from imported quality Tasmanian stock. Call Michel Paulin, 206-864-4200.

ART WORK

GOAT SKETCHES: will do goat sketches from your photos. Can be put on clothing. Margaret Jensen, Box 385, Elgin NE 68636 402-843-2318