CASHMIRROR

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The monthly magazine devoted to cashmere goats and their fiber

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C A S H M I R R O R

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Just the Facts

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The *CashMirror* welcomes contributions of articles and photographs and even ideas for our pursuit. Submissions may be made by mail, fax or e-mail.

No responsibility will be taken for material while in transit or in this office, although we will certainly be real careful.

Cover photo:
Linda Fox, Goat Knoll, Dallas, Oregon
"Real men trim hooves (occasionally)"

Mick's Pics!

"Do I look like a sheep now??"

This is, of course, our pampered cat, Mickey, getting a fill up from Paul's mug of ice water. This isn't our kitchen table, of course, as we don't allow cats—even pampered ones— on the kitchen table.

Sheep and Goat Photo Contest!

The American Sheep Industry has announced their 2003 Photography Contest. Participants don't have to be involved in sheep, lamb wool or goat industries to participate. The only rule is that the photographs must include sheep or goats. Entries must be postmarked by August 8, 2003 and will be judged on clarity, content, composition and appeal.

Awards total $1,000, with individual prizes ranging from $125 to $50.

For more information, contact:

American Sheep Industry Association
Attn: Photo Contest
6911 S. Yosemite St.
Centennial, CO 80112-1414
telephone: Laura Gerhard
303-771-3500, ext 30

Ladies and Gentlemen
Start up your cameras!

"I can look sheepish!"

Reflections

by Linda Fox

Summertime..and the Goatkeeping is Easy...

When spring is good and here and summer is not far behind, our goatkeeping lives become immensely easier. No more expensive hay tossed out every day. No more treks out to the barn several times per day to check on the new kids or check for new kids. No more rotating new mothers and kids in and out of kidding stalls, in and out of new mother pastures and eventual assimilation back to the herd. Our daily chores have quickly diminished to a once a day check of their water and feeding the dogs. The youngest set of kids is several weeks old and they and their mothers have rejoined the main herd. All our goats are in one herd (except for the bucks) and their demands on us are few.

They actually help us in the spring. We open their pasture gate to allow them access along the half mile driveway where they cheerfully trim the grass and woody brush along the sides of the road and in the ditch. They seem to enjoy a change of pace and spend time running up and down "frisking" on the driveway and climbing the steep hill out of the rocky ditch and up the bank. We've noticed that they wear down their feet on the road which lengthens the times between pedicures.

Yesterday, the gate at the road was left open (probably by the meter reader) and when Paul came home from work the goats were out on the County road. Fortunately the road is dead end and seldom travelled and they had only gone up the hill a short ways. They were continuing their brush control chores and munching on the blackberries along the side of the road. When Paul drove up, they scurried back down the road. He said it seemed that they knew they were in forbidden territory and looked very guilty as they hurried back through the gate.

It seems that despite our lack of care this time of year, the goats are healthier. Even the nursing mothers are fat and their coats shine. In the winter we worry, "Are we feeding them too much? Will their kids be too large for birth? Are they too fat? Are they too thin? Are we feeding them enough to grow healthy babies? Are we giving them the right mix of nutrition?" In the spring, we just let them pick and choose. They have plenty of food choices and can choose their nutritional values at will.

We spent a day last weekend trimming feet, worming and administering annual CD&T vaccinations. We also took time to comb out any lingering bits of cashmere missed by the shearer or grown after the shearer was long gone. We also trimmed up any long guard hairs along their lower legs that had no flaw other than looking unfashionable. They could care less about their little spiff up, but it makes us feel good to see neater-looking goats out in the field.

We spent a good deal of last month tearing down our old barn.

Bella and Bella.
(pronounced bay-ya) It means beautiful in Spanish.
Bella, the girl is a member of Paul's new 4-H club.
Bella, the goat, is two days old.

It was on its last legs five years ago and the last few winters, we were surprised (and glad) to get one more year out of it. This last winter, it collapsed. Fortunately, we had not wintered animals there last year. We tore it down, rotten board by rotten board and burned most of it as we removed the boards. We have a few dump runs to dispose of the metal parts left from the disposition, but the eyesore is gone.

A pleasant surprise for us when we finished was the beautiful patch of rich, dark earth underneath, all neatly enclosed is an old foundation wall. Since the barn had been on its last legs for several years, we had let the floor build up with goat manure and layers of straw. Why clean it out when it's going to fall down anyway? At first we contemplated moving the good dirt closer to the new house, but decided that it would make a perfectly nice garden right where it was. Another nice favor done for us by our herd of cashmere goats!

Controlling Stress In Farm Animals

From the Healthy Animals Newsletter Issue 14, March 2003, USDA, ARS

If a farm animal is reared in a stressful environment, its immune response, health and growth may suffer. Often, it may respond with unusual behavior. These indicators can tell producers a great deal about an animal's physical and mental well-being if they know how to read the warning signs. But knowing an animal's needs is only part of the solution. Livestock producers then require new management practices that improve an animal's welfare, but still provides them a margin of profit.

Several ARS research units are examining management practices as they relate to animal well-being. The mission of one location, the Livestock Behavior Research Unit in West Lafayette, IN, is to develop scientifically based measures of animal well-being to improve existing practices and invent new ones that enhance animal well-being and increase the efficiency of dairy, swine and poultry production. Current projects being carried out by the research unit in collaboration with Purdue University demonstrate the balance between animal welfare and production.

For example, West Lafayette researchers are investigating whether feeding high-fiber supplements containing two forms of beta-glucan products from yeast cell walls in conjunction with ascorbic acid (vitamin C) could serve as alternatives to prophylactic antibiotic use. The supplements were found to improve weight gain, health status and overall well-being in Holstein dairy calves. One form of beta-glucan used in feed supplements also improved the calves' immune responses. Research is ongoing into whether the supplements might help alleviate transportation stress in dairy calves. The researchers are looking at the controversial practice of housing sows in crates during long periods of their pregnancies. They found that small alterations of present housing could allow groups of sows more movement and social contact than in gestation stalls and even result in greater weight gains for piglets born to these group-housed pigs.

Other research in West Lafayette has found that through genetic selection, white leghorn chickens can be selected to be non-aggressive and non-cannibalistic and that these changes are reflected in altered brain development. This change in behavior can help the hen adapt very well to modern poultry industry practices. This process of genetic selection is not only applicable to poultry but could be applied to other farm animals.

Researchers want broiler chickens to space themselves out evenly so they are not crowded together in pens, which may increase social stress. A team of researchers determined the effect of early environmental enrichment on behavioral and physiological development in chicks. They found that early age visual imprinting during early life promotes brain structure development and improves spatial memory in chicks.

ARS researchers are working to define stress and find solutions to minimize it in a way that strikes a balance between those with shared interests in livestock well-being.

The West Lafayette unit is part of the ARS National Program Animal Well-Being and Stress Control Systems (#105), which began in 1994 with a mission to develop measures of farm animal well-being by evaluating management practices and observing animal behavior to determine which techniques most benefit animals, producers and consumers. There are three other ARS research units in this program. They are located in Clay Center, NE; Columbia, MO; and Mississippi State, MS.

"Do we *look* stressed?!"

HEAT STRESS

By J. D. Roussel; Louisiana State U., Baton Rouge
From the USDA Extension Goat Handbook

Nearly every life form is affected in some way by high temperatures, and goats are no exception. It is not heat alone that causes stress to the goat; but it is the combination of temperature and humidity when some crucial limit has been reached, which shuts down all bodily functions other than those critical for survival.

Water and Feed Intake

The most immediate impact of heat stress can be seen in changes of water and feed comsumption. As the temperature rises, so does the animal's need for water. Plenty of water should be provided, free-choice, at all times. However, if water becomes scarce, goats hold an advantage over other domestic non-desert species in that they are better adapted to utilize the water content of feeds. However, rising temperatures also tend to reduce voluntary feed intake. This is the result of an attempt by the animal to reduce the production of body heat especially from fibrous feeds, lower physical activity, seek shade and change grazing to night hours.

Nutrition and Reproduction

A long range result of diminished nutrition due to heat stress is a reduced kid crop. If the doe is pregnant, especially near the end of gestation, this heat induced lack of proper nutrition may result in literal starvation of the fetus. On the other hand, if the doe is not pregnant, an insufficient supply of energy due to heat stress will cause absence of follicular development. The same is true for the buck in terms of sperm production. Extremes in heat can affect reproduction directly as well, through 1) sperm and ova degeneration within the reproductive tract, 2) creation of hormone imbalances via action of the hypothalamus, and 3) suppression of libido and the physical act of mating.

Removal of Body Heat

In order to keep such drastic events from occurring, three major physical processes exist by which heat can be dissipated. They are:

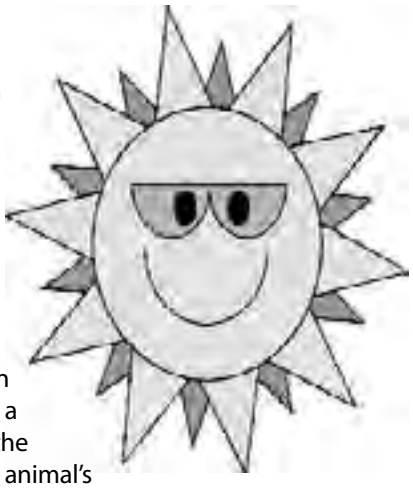
1) convection

2) conduction, and

3) radiation cooling.

Hair Coat

Fortunately, the goat has its own line of defense when environmental temperatures exceed body temperature. The first means of protection is provided by the coat, both from its color and physical characteristics. The principle behind coat color involves the reflection of sun rays. It has been documented that white coats provide maximum protection against radiant heat and



black coats give minimum protection, with variations falling in between. Reflective protection can be provided through physical characteristics of the coat as well. Contrary to popular opinion, long hair which lies close to the body is desirable. In this way, the coat acts as a mat to physically prevent the sun rays from reaching the animal's body. In addition, long hair serves as an insulator from the heat, providing an air buffer zone between the outer environment and the animal's body.

Skin Color

The next line of protection is the skin. Color of the skin is important, except this time darker colors are preferred. The function of the darker skin is to absorb any ultraviolet light which may have penetrated the coat, thereby preventing damage to tissue proteins. Having an excess of skin has also been implicated as providing heat relief. It is believed that this excess skin serves to increase the surface area in relation to body size in order to enhance evaporation. This has been the explanation used in order to account for the large, floppy ears found on goats and other tropical animals. Horns have also been suggested as providing benefit by providing an area where blood can be cooled before reaching the brain. Certainly, the little understood rete of goats is in this connection a unique anatomical structure designed to keep the brain of goats cooler than the rest of the body.

Sweating and Respiration

The greatest form of relief for the animal comes as the result of two seemingly contrasting forces: 1) water evaporation, and 2) water conservation. Water evaporation provides a direct form of relief as the result of two principle forces: 1) sweating, and 2) respiration. Sweating serves to cool the surface, but though it does provide some relief, respiration has been found to have eight times more evaporative capacity, thereby rendering it the chief form of relief from hot temperatures.

Water conservation on the other hand, plays a more indirect, but equally important role in the ability to tolerate heat. This function becomes extremely important if evaporative cooling is to occur when water supplies are scarce or nonexistant, otherwise dehydration will occur. Water conservation occurs chiefly through reduced renal and fecal excretion, and is facilitated by low potassium, high sodium excretion.

Methods of Heat Relief

Continued on next page

Heat Stress
Continued from previous page

If the goat continues to suffer from heat, even with all of these forms of protection, then it becomes the producer's responsibility to aid them.

When keeping animals in confinement, costs are expected to be higher. The most expensive yet most beneficial method of relief is provided by airconditioning. Of course, this investment is usually economically questionable. In order to reduce such costs, experiments have tried to determine if air-conditioning of just the head might provide relief. However, cooling the head or sprinkling with water provided little benefit. Instead, it was best to ensure a roof for protection from the sun, that air be allowed to circulate under the roof and that the roof was sun reflecting or cooled with a water sprinkler.

A long range means of increasing heat tolerance can be accomplished through genetic selection. It is important not to select for individual characteristics, i.e. ear length, but rather for a general over-all tolerance coupled with the capacity to produce milk (OK, so all they can think about is those dairy goats—Ed). Once those individuals have been selected, additional benefits can be gained by cross-breeding to take advantage of hybrid vigor.

Studies are needed to determine the truth behind general opinions that Nubians are more heat-tolerant, -although many are found in Canada; and Saanen are less suited in tropical countries, -although they have made some outstanding contributions in some tropical countries including Israel and Australia, and in crossbreeding in developing countries. Certainly, possible differences between dry and humid tropics for dairy goats must be delineated, but certain Carribean experiences, for example, are very encouraging.

The specific dynamic action of some feed nutrients (e.g. protein and fiber) and the remarkable studies of desert zoologists must be utilized by dairy goat practitioners, since it is now known that some goats need water no more often than every four days and survive very well and produce sufficient milk to raise one to two kids.

Keeping Cool

Think about it. A goat has the equivalent of an internal hot water bottle—the rumen—to keep it warm. It's a big hot water bottle—about 3 to 5 gallons! The water in the "bottle" keeps itself warm with the digestion (fermentation) of the roughage in a goat's diet. This is helpful in the winter when the goat may need additional heat, but in the summer, when adequate (and more) heat is available in the environment, this means more to keep cool.

The range of temperature at which a goat is most productive is 32 - 86^{0}F. Above approximately 86^0, a goat will experience heat stress. Recommended optimal housing temperature for goats, in temperate climates, is 81^0, with relative humidity in the range of 60-80%.

If optimal temperature is exceeded, the goat will attempt to reduce its internal temperature by eating less or getting rid of heat through evaporation from the skin and radiation from the lungs. If a goat runs out of tools to keep its internal temperature under control, it may become less productive or even die.

You can help them stay cool on those warm days by making sure they have adequate cool, clean water. You can also make sure they have plenty of space; overcrowding in shelters increases both temperature and humidity. Low ceilings in shelters increase temperature and humidity—they also help maintain heat in the winter, so you may want to think about this before you give up low ceilings.

Make sure that shade is available on hot days. Given enough individual space and adequate choices, goats will select the environment that they need.

However, beware—moderating temperatures for your goats may contribute to their loss of some of their genetic hardiness after a few generations.

A friend called us many years ago. She was concerned because on a hot summer day, her black goats were laying in the sun rather than in the shade. She was contemplating locking them in the barn to ensure that they stayed cool. Don't! Goats are smart. If they are acting normally, assume they have chosen their location wisely.

Source of Information: Smith and Sherman's Goat Medicine

Hyperthermia
The Signs!

Hyperthermia, not to be confused with hypothermia, is a condition when the body temperature of the animal has increased above the point where the body can regulate it. This is generally caused by high environmental temperature, high humidity and inadequate ventilation. Direct exposure to the sun may also contribute as can overcrowding of livestock. Hyperthermia occurs in most animals, including humans. It is also commonly referred to as heat exhaustion, heat cramps, heatstroke and sunstroke.

Heat cramps occur most often in animals doing hard work in intense heat.

Early sign of hyperthermia include panting, sometimes with the neck stretched out, open mouth breathing and excessive sweating. There may not be an increase in internal body temperature.

Later signs of hyperthermia include weakness, muscle tremors and collapse. A staring expression, vomiting and diarrhea may also be signs.

An Experiment with Rhododendrons

An experiment was conducted with goats and rhododendrons. Eighteen goats were offered free choice rhododendron clippings. Of the test subjects, two of them suffered convulsions and died. All of the remaining goats lived to tell the tale, but suffered a weight loss. Seven of them showed a sudden drop in milk production.

Before you conduct your own inadvertent experiment with rhododendrons or azaleas, you may want to make sure that your goats do not have access and that well-meaning neighbors are also aware of the danger.

Most of us have our tales to tell about goats and rhododendrons. Often goats will discover forgotten rhododendrons in the middle of a brush patch or those well-meaning neighbors will toss their yard trimmings over the fence for your herd.

Rhododendrons!

They're Pretty But...
They're Poisonous to Goats

Rhododendrons and other members of the heath (Ericaceae) family including laurels, azaleas, lily of the valley and Japanese pieris, are poisonous to goats. They contain andromedotoxin, a substance which acts primarily on the autonomic nervous system of the goat. Ingestion of these plants will induce vomiting and other symptoms including hypotension (low blood pressure). It doesn't take much to cause a problem—as little as 0.1% of the animal's body weight ingested as fresh leaves may cause clinical signs.

Within 6 hours of eating the plant, the goat may show signs of depression, weakness, anorexia, salivation, abdominal pain, vomiting and maybe bloat or diarrhea. If small amounts of the plants are consumed, the harmful substance will eventually be eliminated—through one end or the other. If a large enough quantity is ingested, death may occur.

If exposure is noticed before symptoms occur, a rumenotomy before onset of signs is recommended. This is a procedure where rumen contents are removed. If symptoms are present, they may last several days and your treatment would be only symptomatic. Treatment might include intravenous fluid therapy to counteract the hypotension, insertion of stomach tube to release bloat if necessary, oral treatment with magnesium hydroxide and activated charcoal and injections of calcium. To prevent aspiration pneumonia due to vomiting, an antibiotic may also be useful.

If much has been injested or if you are unsure of the amount, you will want to work with your vet.

Agriculture Information - Bulletin 415

Plants Poisonous to Livestock in the Western States From USDA Poisonous Plant Research Laboratory

Poisonous plants are a major cause of economic loss to the livestock industry. Each year these plants adversely affect 3 to 5 percent of the cattle, sheep, and horses that graze western ranges. Livestock losses can be heavy if:

1. Animals graze infested ranges when plants are most toxic.

2. Animals are driven or trailed through or unloaded from trucks onto range or pasture areas infested with poisonous plants.

3. Animals are not watered regularly or are allowed to become hungry. Such animals are more likely to eat lethal quantities of poisonous plants.

4. Animals are allowed to graze in heavy stands of plants that are highly poisonous, such as locoweed or larkspur.

Animals are grazed on rangelands early in the spring when there is no other green vegetation except poisonous plants. There are no known treatments for animals poisoned by most poisonous plants. Where a treatment is available, affected animals are usually in remote places and cannot be reached until it is too late to apply the treatment. When they have recovered enough to be handled, treatment should consist primarily of symptomatic treatment except where a specific treatment is known.

Prevention of loss from poisonous plants in general is a problem of range and livestock management. Proper diagnosis of livestock poisoning is essential in the identification of specific plant poisoning; however, under range conditions, livestock may eat large quantities of poisonous plants in a short time. Under these conditions, animals may not exhibit typical signs or lesions characteristic of the poisoning. Symptoms listed for each plant toxicity are those most likely to be observed. Not all symptoms will be seen in all toxicities and signs of poisoning may vary greatly, depending on dosage and the time it takes to consume the dose. Also, individual animals respond differently to poison. To protect you animals from poisoning:

1. Learn to identify the poisonous plants that grow on your range.

2. Learn the conditions under which these plants can be dangerous to your livestock.

3. Develop a grazing plan to improve your range and prevent poisoning of your livestock by plants. Graze your ranges at the proper time. Do not overgraze them.

4. Do not allow animals that have been under stress or that are overly hungry to graze in areas infested with poisonous plants.

5. Provide adequate water for your livestock.

6. Be especially careful when grazing newly introduced livestock on your range.

7. Provide adequate salt and other supplements as needed.

8. Control poisonous plants where feasible.

If your animals get sick, consult your local veterinarian to insure proper diagnosis and treatment. If a poisonous plant is involved, identification of the plant is essential for any corrective action.

Poisonous Plants

Cyanide or Prussic Acid-Containing Plants
Arrowgrass (Triglochin spp.)
Chokecherry (Prunus spp.)

Neurotoxic and Myotoxic Plants
Deathcamas (Zigadenus spp.)
Larkspur (Delphinium spp.)
Locoweed (Astragalus and Oxytropis spp.)
Selenium Accumulators (Astragalus spp.)
Milkvetch (Astragalus spp.)
Rayless Goldenrod (Haplopappus heterophyllus)
Lupine (Lupinus spp.)
Poison-hemlock (Conium maculatum)
Water Hemlock (Cicuta douglasii)
Western False Hellebore (Veratrum californicum)

Gastrointestinal Irritants and Toxins
Bitterweed (Hymenoxys odorata)
Colorado Rubberweed or Pingue (Hymenoxys richardsoni)
Sneezeweed (Helenium hoopesii)
Copperweed (Oxytenia acerosa)

Abortifacient and Reproductive Toxins
Ponderosa Pine Needles (Pinus ponderosa)
Snakeweed/Broomweed (Gutierrezia sarothrae and microcephala)

Photosensitizing Plants
St. Johnswort (Hypericum perforatum)
Spring Parsley (Cymopterus watsonii)

Nitrate-Accumulating Plants
Nitrate Summary—see article below

Oxalate-Containing Plants
Greasewood (Sarcobatus vermiculatus)
Halogeton (Halogeton glomeratus)

Continued on next page

Poisonous Plants
Continued from previous page

Hepatotoxic and Pyrrolizidine Alkaloid-Containing Plants
Groundsel (Senecio riddellii and S. longilobus)
Tansy Ragwort (Senecio jacobaea)
Horsebrush (Tetradymia glabrata and T. canescens)

Cardiac Glycoside-Containing Plants
Hemp Dogbane (Apocynum cannabinum)
Milkweed (Asclepias spp.)

Miscellaneous Poisonous Plants
Bracken Fern (Pteridium aquilinum)
Oak (Quercus spp.)
Yew (Taxus spp.)
Yellowstar thistle
Leafy spurge
Bur buttercup
Kochia Houndstongue (Cynoglossum officinale)

Nitrate-Accumulating Plants

Crops such as oat hay, sorghum, corn, sudangrass, Johnsongrass, beets, and weeds such as carelessweed, kochia, pigweed, Russian thistle, and nightshade, are examples of plants that accumulate nitrate. There are many more. Plants containing more than 1.5 percent nitrate (as KNO_3) dry weight may be lethal to livestock. Sublethal effects may occur in livestock from eating feed containing between 0.5 and 1.5 percent nitrate. Nitrate poisoning can also occur in animals that eat nitrate fertilizers, machine oil, and some natural well and pond waters.

Plants differ in their ability to accumulate nitrate. The type of soil, availability and the form of nitrogen present in the soil, various environment factors and chemical or physical plant damage influence the amount of nitrate in many of these plants. For example drought conditions, frost, or treatment of nitrate-accumulating plants with 2,4-D may cause plants to accumulate excessive amounts of nitrate. Nitrate accumulates primarily in the vegetative tissue of plants while the seed remains safe.

Where and When Nitrate Poisoning Occurs
Nitrate poisoning occurs throughout the United States, primarily in animals that have eaten nitrate-accumulating plants. Harvested and stored forages continue to be toxic.

How It Affects Livestock
Nitrates are converted to nitrite in the gastrointestinal tract. Nitrite causes the production of methemoglobin, a type of hemoglobin that cannot carry oxygen. Thus, the effects of nitrate poisoning result largely from oxygen starvation or, in effect, suffocation. The amount of plant material required to poison an animal depends on the amount of nitrate in the plant and, to a lesser degree, on the rate at which the plant is eaten. Many factors affect toxicity, but in general about 0.05 percent of an animal's weight of nitrate is near a minimum lethal dose. Poisoning occurs primarily in ruminants.

Signs and Lesions of Poisoning

Acute poisoning:
Blue coloration of membranes of mouth, eyes, and other mucous membranes (cyanosis)
Shortness of breath
Staggering gait
Death
Chocolate brown blood
Muddy, cyanotic mucus membranes
Congestion of rumen and abomasum

Subacute poisoning:
Watering eyes
Unthrifty appearance
Reduced milk flow
Reduced weight gain
Abortion and infertility

How to Reduce Losses
Crops that accumulate nitrate and grow under conditions favoring nitrate accumulation should be checked for nitrate content. High nitrate forage should be diluted with low nitrate forage to decrease nitrate intake, or if there are indications of nitrate toxicity, the feeding of nitrate-accumulating forage should be discontinued. Signs of vitamin A deficiency have been associated with the feeding of low levels of nitrate suggesting vitamin supplements may be useful.

Genetics and Animal Health

From the United Nations FAO Agriculture21 Magazine

As veterinary drugs falter in the face of increasingly virulent pathogens, FAO proposes to improve animal health strategies—by breeding for disease resistance.

Gastrointestinal infections caused by nematode parasites—more simply, worms—are one of the most serious diseases of livestock world-wide. And, using conventional disease control strategies, the problem can only get worse: in all major sheep-producing countries, nematodes have developed resistance to chemical de-wormers (anthelmintics), and long-promised vaccines against the parasites are still not commercially available.

But, suggests a recent FAO study, there is another straightforward—and sustainable—strategy against nematodes. First, collect the faeces of young sheep and count the worm eggs. Then, identify those animals with the lowest number of eggs and the most desirable production characteristics—and you have found the rams or breeding females most suitable for producing flocks with nematode resistance. (Alternatively, check eyelid colour to assess infection-induced anaemia.)

The FAO study, Opportunities for incorporating genetic elements into the management of farm animal diseases, argues that governments and the livestock sector have generally overlooked the potential of simple—as well as very high-tech—genetic approaches. It says enhanced disease resistance or tolerance will lead to reduced need for inputs, especially drugs, and would be especially beneficial in low-input agricultural systems in developing countries. The A21 Magazine posed the following questions to Keith Hammond, of FAO's Animal Production and Health Division:

Q: Does this mean farm animals are generally not bred to resist disease and infection?
Hammond: "It's worse than that. In the developed world, breeding has focused almost exclusively on characteristics such as the milk, meat, egg and fibre produced, with drugs as virtually the only disease management strategy. The result is a serious reduction in the genetic potential of our livestock populations to resist or to tolerate infection, while actually increasing the genetic infectivity of the parasites themselves—worms, bacteria and viruses. In much of the developing world, of course, there is often a shortage of drugs to treat disease and infection, which explains annual losses of 30-35% in the livestock sector. The farmer is left to suffer losses, or treat individual animals as best he or she can."

Q: The FAO report says chemical intervention strategies are "not biologically sustainable". How serious is the problem?
Hammond: "As well as increased nematode resistance to anthelmintics, we are seeing increasing bacterial resistance to antibiotics, which is especially worrying for intensive production systems where antibiotics are used to control unknown and sometimes sub-clinical disease problems. There is now widespread resistance to the drugs used to control protozoans responsible for animal trypanosomiasis. With each new generation of vaccine for Marek's disease in poultry, a new and more virulent strain of the virus has arisen. Even for foot-and-mouth disease, many governments consider the available vaccines inadequate to the challenge."

Not a beauty contest
In humid areas of Kenya, indigenous Red Maasai sheep are more resistant to roundworm infections than the modern Dorper breed.

Q: In practice, how would "genetic elements" be incorporated in disease management strategies?
Hammond: "For almost every disease that has been intensively and carefully investigated, evidence has been found for host genetic variation—some animals are more resistant or more tolerant to the disease than others. Almost certainly, there will be genetic variation for a wide variety of other diseases."

"There are three levels of genetic differences to consider: species, breed and unique genetic variation among animals within each breed. These levels will have most impact when applied in combination. A simple example at species level: goats are far more resistant to the footrot fungus than sheep. At breed level, we need to choose those most appropriate for the production environment - in tropical countries with severe endemic diseases that exotic breeds are not adapted to, locally adapted and indigenous breeds are likely to be superior to imported exotic genotypes. Where exotic breeds are appropriate in every other respect, crossbreeding can introduce genes for tolerance or resistance. And finally, individual animals would be selected for breeding based on their resistance or tolerance, which could be established through simple observations or using genetic markers or gene tests to assist in the selection."

Q: Which diseases are most responsive to genetic strategies?
Hammond: "Most animal diseases present opportunities for incorporating genetic elements in disease management. Progress is already being made in using genetics to eliminate scrapie in sheep in Europe (see box at right). Convincing research has shown that many breeds of goats and sheep have better performance in the presence of worm challenge than other breeds. For example, in humid areas of Kenya that are heavily infested with nematode parasites, the native Red Maasai sheep is far more resistant to roundworm—and produces three times more meat—than improved breeds such as the Dorper. In poultry, research indicates substantial opportunities for incorporating genetic elements into disease management for Newcastle disease, coccidiosis and nematodes, but new knowledge is needed to take genetic approaches to smallholder systems, where the benefits are potentially enormous."

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Genetics and Animal Health

Continued from previous page

Q: But life evolves—won't parasites adapt to genetic changes in the host?
Hammond: "Any control measure that aims at reducing numbers of parasites can lead to genetic change in the parasite population to evade the control strategy. This is best documented in the case of antibiotics. And it could also happen in the case of using genetics. This has been documented in plants, but there are currently no recorded examples of it occurring in domestic animal populations. For macro-parasitic diseases, such as gastrointestinal parasites, genetic improvement of resistance will lead to only weak pressure on the parasite to evolve. This is in contrast to chemical control measures that impose strong selection pressure. Therefore, in parasite evolution terms, genetic strategies are expected to be more sustainable than many other intervention strategies for those infections. However, this may not be true for bacteria and viruses, where evolutionary change in the parasite population may eventually occur."

Q: How important for disease management are today's rapid advances in the field of molecular genetics?
Hammond: "They will be crucial. There is already a broad range of potentially very powerful molecular techniques and procedures, and they're being added to practically by the day. Work on the biology of avian and mammalian livestock - which are more complex than plants - is being greatly facilitated by the massive amount of molecular genetic work on human diseases. The revolution in animal molecular genetics offers vast potential for major breakthroughs in understanding disease, at the genetic, protein, physiological, animal and population levels. Over the next 10 to 15 years we are going to substantially change many, if not most, animal disease management strategies."

Q: Is there a risk that the genetic approach will require technologies—such as molecular markers—unavailable in many developing countries?
Hammond: "In the short-term, genetic management will generally use technology somewhat simpler than genetic markers—more frequently, selection of individual animals or breeds with enhanced resistance will rely on phenotypic assessments. There are a number of diseases, especially those affecting extensively managed ruminants, where sufficient knowledge exists to start selection of individual animals or breeds for resistance immediately.

"But let's not forget that an integral part of the biotechnology revolution is the promise of low-cost, sustainable procedures that could be incorporated in developing country's disease management strategies. Biotechnology now also offers extra tools to understand the epidemiology of diseases, such as rinderpest, peste des petits ruminants, and foot-and-mouth, as never before. Characterization of their viruses by both proteomics and genomics will help us fine-tune vaccine structure for improved efficacy. But, more importantly, it facilitates a shift to a new paradigm of targeted disease control which is far more economic with resources."

Operation Scrapie

European countries are using genetics to eradicate sheep susceptibility to transmissible spongiform encephalopathies (TSE), more widely known in cattle as "mad cow disease". Called scrapie in sheep, the disease is believed to be caused by accumulation in the brain of wrongly folded proteins—or prions—that are resistant to the enzymes which would normally destroy them. Research has identified the genetic basis for resistance to scrapie, allowing governments to launch long-term breeding programmes that are using resistant rams to change the genetic composition of the continent's sheep population.

Q: So genetics-based management is not intended to replace chemical interventions?
Hammond: "We need to integrate genetic and non-genetic approaches to health management. Used effectively, the components can complement each other and reduce the risks of any one component breaking down. For example, reduced reliance on chemical control prolongs the effective life of those chemicals before resistance develops. This is because selection pressure on the parasite population and the number of selection events is reduced. This diversity of approaches within a single management programme is what has made integrated pest management [IPM] programmes such a success."

Disease and infection
The FAO report makes a distinction between infection and disease, and between tolerance and resistance.

Infection is the colonization of a host animal by a parasite, including viruses, bacteria, protozoa, helminths, flies and ticks.

Disease describes the effects of the infection, which may take several forms—acute, sub-acute, chronic and sub-clinical—and may or may not be debilitating.

Continued on next page

Genetics and Animal Health
Continued from previous page

Resistance is the ability of the individual host to resist infection or control the parasite lifecycle.

Tolerance indicates that an animal may be infected by a parasite, but shows few measurable symptoms of disease.

Infection management aims at reducing or eliminating transmission among a population of host animals, thus reducing the incidence or severity of a disease, or even its eradication.

Tolerance management—i.e. improving animals' tolerance to infection—will alleviate the symptoms, but could lead to more serious disease problems in the future.

For more information on this subject, you can download the FAO study, Opportunities for incorporating genetic elements into the management of farm animal diseases at:

http://www.fao.org/ag/magazine/021sp2.htm

It's a 39 page pdf file.

Estimating Yield

By Linda Fox

Yield is one of the important traits we look for in our cashmere fleece. How much cashmere does the fleece contain? Raw fleeces of equal weight may contain very different quantities of cashmere. Yield is generally indicated as a percentage, the amount of cashmere by weight contained in the fleece. A 30% yield would indicate that 30% of the raw fleece is cashmere. A 580 gram fleece with a 30% yield would contain 174 grams of cashmere, or about 6 ounces. This amount is often referred to as "theoretical yield." Even though this yield number represents the amount of cashmere contained in the fleece, it will not be the amount you obtain from a commercial dehairer, or probably even from your own careful hand dehairing. Some cashmere will be lost in the separation process. However, the theoretical yield is still a good number to have.

I consider cashmere yield one of the "big four" cashmere factors—cashmere diameter, style, length and yield. Unless you have an obsession for a particular cashmere color or a penchant for long-haired goats, your "big four" factors will likely be the same as mine. These factors determine our likelihood of hanging on to a particular goat (vs. culling) and will influence our breeding decisions. So, how do we non-experts determine yield? Other than a big fat guess.

Yield can be subjectively measured just like diameter and length. Normally a person judging yield will not indicate a percentage; a judge or classer will only assign a label of "Low", "Average", or "High" yield.

Three of our "big four" can be objectively measured. Cashmere diameter can be measured by sending a sample of the fleece to Yocom-McColl or one of the other testing places. A recent study by Lupton, Pfeiffer and Dooling (summary printed in 3/99 CM) indicate that a new objective test for style may be useful. Length can be measured by anyone using a ruler.

I remember our second year's harvest of cashmere in 1996. We had Terry Sim shear and grade our fleeces. He filled in his grading sheets (form and key on next two pages) with his judgements of diameter, style, length, yield and other information about each of our goats. After he left, I weighed the fleeces and added that measurement to the sheets. I noticed that the final column on his grading sheet was titled "Est'd Down Wt." Before I sent our harvest off to the Co-op, I wanted to know about how much cashmere we had in our fleeces. I wanted to know this to estimate the amount of cashmere that we would be paid for and also just because I like to play with numbers. So I computed an Estimated Down Weight to add to the sheet. To compute the yield, I used the Co-op's estimates of yield. Their

Continued on page 16

Cashmere America
Fleece Appraisal Form

Farm Name: **Classifier:** **Date:**

Tag #	Live Wt (#)	Sex B D W	Age (DOB)	Color WW WC GY BR MC	MFD F M C	Down Cover 1 2 3 4	Length (")	Fiber Style 1 2 3 4	Est'd Yield L A H	Frame 1 2 3	Condition 1 2 3 4	Total Fleece Wt	Est'd Down Wt
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		
		B D W		WW WC GY BR MC	F M C	1 2 3 4		1 2 3 4	L A H	1 2 3	1 2 3 4		
Teeth?				Conformation:							Hooves?		

Fleece Appraisal Form—Designed by the Cashmere America Cooperative
A useful tool to record information on your herd's fleeces at harvest time.

Cashmere America Fleece Appraisal Form Key

SEX

B Buck
D Doe
W Wether

MFD (MEAN FIBER DIAMETER)

F Fine, under 16.5 micron
M Medium, 16.5 - 18.5 micron
C Coarse, 18.5 - 20 micron

DOWN COVER

1 Minimal, short, midside only
2 Midside and back legs, length 1.5" no or short neck fiber
3 Midside, back legs & side of neck
4 Midside, back legs, side and front of neck, and possibly belly

DOWN LENGTH

Base on average of neck, midside and rump measurements

FIBER STYLE

1 Poor, cashgora type
2 Average, cashmere type with some plain down fibers
3 Good, typical cashmere type
4 Excellent cashmere type, ideal

COLOR

WW White/white
WC White/Colored
GY Grey
BR Brown
MC Mixed Colors

YIELD

L Low, under 20% yield
A Average, 20 - 35% yield
H High, over 35% yield

FRAME

1 Small frame
2 Average frame
3 Big frame
4 Very big frame

CONDITION

1 Poor
2 Fair
3 Prime
4 Fat

HOOVES

G Good, straight, strong
A Average, sound
P Poor, weak, defective

TEETH

G Good, strong incisors, meet pad evenly
A Average, sound
P Poor, incisors don't meet pad, weak teeth

Editor's hint: If you copy the form at left, copy this on the back of the page, so you will always have a handy reference.

Estimating Yield

Continued from page 13

Key to the appraisal form indicates:

L	Low yield	under 20%
A	Average yield	20 - 35%
H	High yield	over 35%

I used 20% for Low, a middle of the road 27% for Average and 35% for High yield. When I received my check and data back from the Co-op, my cashmere weight totals were within a few ounces of their calculations. This enabled me to be fairly confident that my method for computing cashmere production per goat was fairly accurate, or at least my overall total was in the ball park even if the individual calculations were off.

My method for determining cashmere production was only possible because I had an expert's estimation of yield. What if you don't have this? There is another way. There is an old article published in CM, January 1995, by J. D. Winter, B. J. Restall and D. De'ath entitled "Estimation of Down (Cashmere) Yield in Goats Using Fiber Length Measurement." This article illustrates a method of estimating cashmere yield by using only the length measurement of the cashmere and of the guard hair.

Research was conducted in the early 1980's in Australia, using 68 unselected young feral goats to develop a method and a formula for computing yield using only fiber length measurements. The article mentioned ongoing research (in 1995) on 1,500 goats of varying age groups that was currently being analyzed and updated, but I can find no traces of later published research on this, so I'll just use what is contained in the original paper.

The magic formula for determining yield is:

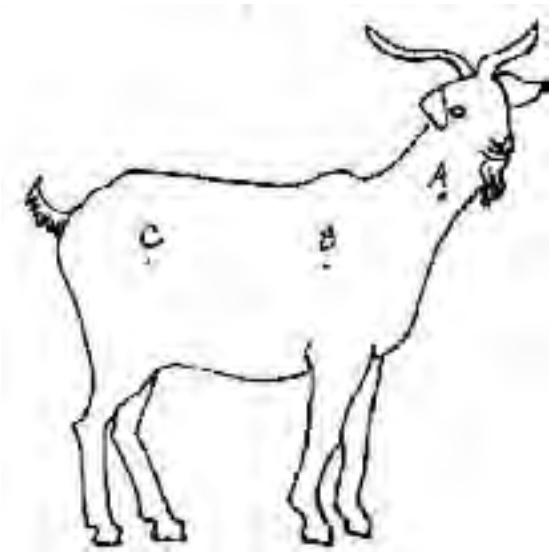
$$Y=0.3925C - 0.7315 + 0.324(C)^2 + (85.54/G)$$

Y = yield of down as a percentage
C = mean down length
G = mean guard hair length

When the researchers applied this formula and compared their results to objectively measured yield, there was a correlation coefficient of 0.86. This is good; there is a high correlation between the formula-derived results and the tested results. The expected error by using the formula is ± 2.15%. Considerably more accurate than a big fat guess.

The use of this formula will enable you to calculate your amount of cashmere using three easily measured factors—the weight of the fleece, the length of the guard hair and the length of the cashmere.

What? I hear you mumbling something about the cashmere and guard hair length not being the same over the course of the entire goat. No problem. The article recommends that you take three samples of both types of fiber from the goat at three specified locations—see specified locations numbered A, B and C indicated on the goat above.



Sample sites on the goat—take a sample of cashmere and guard hair from sites A, B and C, measure them and average the three.

You will compute an average, both for the cashmere and guard hair. These averages will be inserted into the formula at left and then you solve the equation for Y—which is easier said than done. Y will be the calculated yield percentage which you can then multiply by your total fleece weight to have an estimated weight of cashmere produced by each of your goats.

Producers who are computer spreadsheet savvy can create a spreadsheet with columns to insert their six individually measured lengths and the total fleece weight. The spreadsheet will compute the yield and the calculated amount of cashmere.

Or, if you'd really rather not play with Excel and have better things to do than deal with a sheetfull of numbers, never fear. The researchers created a table (previous page) that you can use to arrive at a similar conclusion. The chart uses centimeters, so you'll either have to take your measurements in centimeters (those little lines on the other side of the ruler...) or go ahead and take your measurements in inches, average the inches and then convert your average to centimeters (1 cm = .3937 inches). To use the chart, look up the average cashmere length on the bottom of the chart, and find your average guard hair length on the right side of the chart. Follow the two lines into the chart, and where they intersect is the approximate yield percentage, which is listed on the top.

Continued on next page

Estimating Yield

Continued from previous page

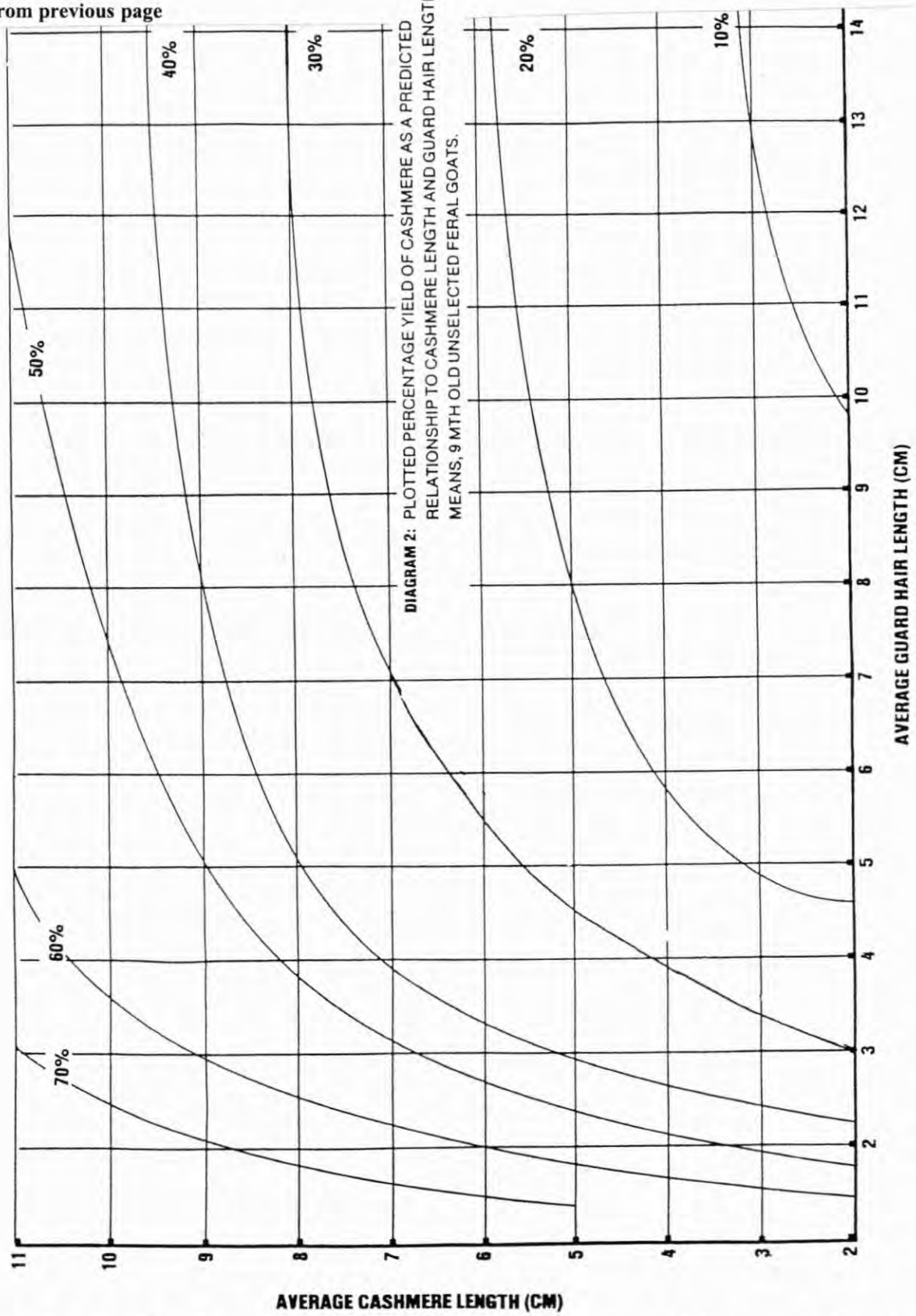


DIAGRAM 2: PLOTTED PERCENTAGE YIELD OF CASHMERE AS A PREDICTED RELATIONSHIP TO CASHMERE LENGTH AND GUARD HAIR LENGTH MEANS, 9 MTH OLD UNSELECTED FERAL GOATS.

Chart for computing estimated cashmere yield as a percentage of a total shorn fleece—find the average cashmere length (in cm) on the bottom, and the average guard hair length (in cm) on the right. Where the two lines intersect, read your estimated percentage across the top of the table.

Estimated Yield
Continued from previous page

A spreadsheet (don't you love 'em?)
Remember how I said that the spreadsheet-inclined could make the computations a lot more fun? After I mentioned that idea on page 16, I was so excited that I left the first part of this story on the computer screen, took my clipboard, ruler and postage scales and rushed to the room above the garage to weigh and measure fleeces. I already had an average measurement for the cashmere fibers, determined when we had shorn the goats, but had not yet weighed the fleece or the measured the guard hair.

I took measurements from each bag on three random grabs of guard hair. I knew my results wouldn't be perfect as I had no clue where on the goat each guard hair sample had grown. I could easily have pulled three samples from the leg or two from the neck and one from the rear. But, at this point, with the fleeces off the goat and in the bag, I had no opportunity for anything else—unless I wanted to spend a lot of time laying out each fleece and trying to figure out where each section had grown—and I didn't as I had a story on the screen to finish!

On the next page is my spreadsheet created for the purpose of allowing me to enter the six measurements and one weight, and then have the spreadsheet compute the rest for me. It works wonderfully. In addition to using the formula to compute the percentage yield, I added a column to display the amount of cashmere weight in grams. Not being able to stop there, I totaled everything in sight, converted the grams to ounces, and then to pounds and computed an overall average yield. For my sample of 17 fleeces, weighing a total of 5,876 grams (or 13 pounds), using the formula, my average yield is 29%, and the estimated cashmere produced by these 17 goats is 61 ounces, or about 4 pounds.

I was curious if this formula-driven method would come close to my earlier method of calculating yield and since I could just add to my existing spreadsheet to check this out, I did. I did not have the value of an expert eye to determine the yield, but when we sheared and graded our fleeces this year, we had made our own guess about the yield, using the Low, Average and High designations. I again used 20% for Low, 27% for Average and 35% for High yield and calculated more columns. By extending these values, I arrived at a different set of yield numbers. Some were fairly close to the formula yields and some were quite different. Overall, my computed percentage of yield was 1% less, and total cashmere weight was 3 ounces less. Not bad, but I would feel more confident about using results for the individual goats if most had been closer to the formula-calculated yields.

Next year, I will take data samples from the goat when we shear and compute a truer value using the formula and test my quickie method against that, to determine which method we will use for future estimates of yield. If the results are similar on an overall basis, I will probably resort to my quickie method as it involves gathering less data. However, if you are more concerned about the amount of cashmere produced by each individual goat (and you probably should be), accuracy on an individual basis would be as important as the overall total.

Other Issues
As pointed out in the 1995 article, this formula was developed using 9 month-old Australian feral goats, unselected for cashmere production and the results obtained from their study may not apply to different herds or different ages of goats. Also, as you've probably noted, the formula is designed for shorn goats. You combing people will have to come up with your own formula.

At a classing clinic I attended in October 1997, Ann Dooling mentioned a method of determining yield developed by the Australian using the relative lengths of cashmere and guard hair. I believe that she was referring to this formula method described here. She said the formula was based on a standard rate of primary vs. secondary follicles and that she didn't believe the formula to be very accurate as the S/P ratios are not the same for all goats.

If you are using a yield estimating method of any sort to determine the weight of cashmere you have in order to monitor the performance of a dehairing/processing company or to check the accuracy of an outside entity who may be purchasing your cashmere based on weight, consider the limits of your methods and the differences between "theoretical yield" and "actual yield." Many companies who purchase your cashmere, pay you on the basis of the amount of cashmere that will be usable after their processing procedures. Cashmere is always lost in processing, so even if your yield estimating methods produces a totally accurate amount of cashmere in your clip, your calculated amount will be less than the amount you will be paid for. Also, if you have your cashmere dehaired and/or made into yarn, there will be processing losses here as well. So, your calculated number will be lower—how much lower is acceptable is a decision you will need to make.

This doesn't mean that your calculated information is not valuable. With an estimated amount in hand that you believe you have produced, you can monitor and compare the processing losses of various companies.

You will also be more aware of the individual production of each goat, rather than merely looking at the total production of your herd. Maybe the yield number in itself isn't such an important number, but using it will allow you to compute the cashmere production per goat. A goat with a 600 gram fleece, with a 20% yield produces about 4 ounces of cashmere. A goat with a 200 gram fleece, with a 40% yield produces the same 4 ounces.

If you would like a copy of the spreadsheet template mentioned in this article, email me and I will send you a copy:
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Estimated Yield
Continued from previous page

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You will need your own copy of the Microsoft Excel program in order to use it.

Farm Name:	Goat Knoll								
Estimated Yield of:	17 Selected fleeces 2003								
Date:	6/8/03								
	Fleece	**Guard Hair Length**			**Cashmere Length**			**Estimated**	**Estimated**
Fleece ID	**Weight**	**A**	**B**	**C**	**A**	**B**	**C**	**Yield**	**Cashmere**
W96 Pearl	199	4	4	2.5	1.25	1.25	1.25	25%	49
W20 Nichelle	542	5	4	3.5	1.5	2	2	22%	117
R34	435	5	3.5	5	1.5	1.5	1.5	20%	85
Fancy	515	2	3.5	2	2.5	2.5	2.5	36%	188
B38 Twinkette	318	2	2.5	1.5	2.5	2.5	2.5	45%	143
Buster02	683	5	4	2.5	4	4	4	28%	194
UB40	316	3	2	3	2	2	2	33%	106
W85	214	5	2	1.5	2.5	2.5	2.5	32%	69
W74	307	1.5	5	4	1	2	3	26%	79
W76	238	4.5	4	3	1.5	2	2	23%	56
R59	359	2.5	2	4	2.5	3	3	33%	119
W83	185	5	2.5	1	2.5	2.5	2.5	32%	60
W91	270	2	3	2.5	3	3	3	38%	101
G12	147	2.25	2	2	2.5	2.5	2.5	43%	64
W54 Shelton	303	4.5	3.5	4	2	2	2	23%	69
R50 Mufassa	603	6	6	5	2.5	2.5	2.5	17%	105
W62	242	2	2	1.5	2.5	2.5	2.5	49%	118
Total in grams	**5,876**								**1,723**
Total in ounces	**207**								**61**
Total in pounds	**13**								**4**
Average yield									**29%**

Excel spreadsheet showing computation of estimated yield, percentage and weight, of cashmere fleece for 17 goats. You will notice that in most cases, all three numbers for the cashmere measurements are the same—this is not normal. Since I had already computed an average cashmere length when we sheared the goats, I entered the same number in all three slots.

WORKING GOATS

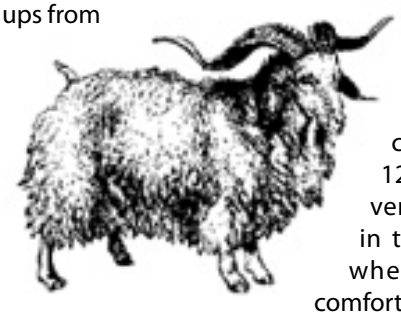
Goats R Us is a family owned and operated grazing company (in northern California). Our livestock is utilized primarily for fuel mitigation and star thistle eradication, although recently they have gained quite a reputation for winter brush reduction projects. The herd is a melting pot of a variety of breeds: Angora, Alpine, Spanish, Boer, Pygmy, Lamancha and Nubian. The goats are separated into several herds of various sizes, depending on the scope of work. Each bunch is maintained by a goatherd and his border collie, who live with the animals on the premises in a self contained travel trailer. In open space areas, they work "free", supervised by the man and dog team, and are secured at night in holding pens. When working sites near residential neighborhoods, portable electric fence is used to contain the goats. Their annual visits have become quite popular with the public and indeed have turned into somewhat of a local event!

RETIREES

As with any good company, Goats R Us has a retirement program for its loyal 4 footed employees. The goats in our herd are never sold for any reason, and when their "golden years" approach, their scope of work is kept local, just outside of our ranch, where they can roam the hills without encumbering the stress of traveling between locations. All goats are supplemented year round, wormed twice a year and vaccinated, but the geriatrics are given special consideration. They are our "buddies", and an integral part of our team, without whom we wouldn't be able to enjoy our success. Frequently, these retirees are visitors at local schools or senior centers becoming ambassadors for their kind.

FERAL GOAT RESCUE

In 1999, Goats R Us was enlisted by the animal rights group, "In Defense of Animals", to capture and remove wild goats from Catalina Island. One by one, the men from the GRU team caught the wild goats, with aid only from ropes, radios, and of course, their remarkable dogs. Keeping the newly captive animals secure, calm and in good health was our main concern. To this end, all parties involved (GRU, IDA, and the Catalina Island resident volunteers, particularly Debbie Avellana and Rudy Piltch) did a stupendous job! After 10 weeks of 5am start ups from their campsite, often in heavy fog, and many days of walking upwards of 20 miles on the steep cliffs, they had gathered 120 head. This group was very carefully transported in two loads to our ranch, where they have adjusted comfortably. The next generation of Catalina Island goats is now being born on the mainland.



THE TEAM

Goats R Us was the product of a dream. Egon Oyarzun and his wife, Terri Holleman, pursued a goal to incorporate the animals they treasured into their everyday life. With the help of their young son, they began with 54 goats working in neighbor' yards to clear the brush and poison oak. This idea blossomed, and the business grew at lightning speed, creating the need to expand. The shepherds recruited from South America to tend the livestock quickly became part of the extended family as did the support personnel necessary to help this growing business function. Other indispensable members of the group are the magnificent hard working Border Collies, all of which are bred, raised and trained by GRU staff. Together, they became a true working team.

Contact GRS at: info@goatsrus.com
510-526-3337

Information from the Goats R Us website, reprinted with their permission

Back to Basics
Hoof Trimming 101
(maybe 102)
By Paul G. Johnson

To find an example of a perfectly trimmed hoof, first thing to do is look at a newborn kid's hooves. This is your goal. Nice, even, flat foot.

We all know the problems of bad hooves. Foot rot, crippled goat, and more trouble and expense to the goat farmer. If you don't live in a part of the country with rocky soil which normally keeps hooves trimmed for you, you will need to deal with hoof maintenance on a regular basis to avoid hoof problems.

The necessary equipment is simple: a hoof trimmer, sharp knife, or small hand pruning shears; milking (or other type) stand; some grain, blood stopper (or corn starch), antiseptic, and a comfortable place to do all this. From here on, we discuss the methods we use, and/or have read about from the sources listed at the end.

Hoof trimming can be a pleasurable experience for you and the goat. Really! It is a good time to assess the goat's health, and help make him/her easier to handle in the future. It is also a good time to update shots and wormers.

Now, assuming you have caught your goat, and have it tethered or in a stand, sit or crouch next to the goat and raise a front foot. We sit by them, as they tend to lean on us for balance. Gently grasp the foot, raise it to a position easy to work on and not uncomfortable for the goat. The goat will let you know if it is uncomfortable. Some more than others. Start at the back of the hoof. You should see the two separate toes. We start on the wall of the hoof, which may be overgrown. If too badly overgrown, trim until pink, and return to it a week or so later. Trim the wall back and down, picking out dirt and rocks with the tip of trimmer. Be sure to trim off any excess left. Work towards the front, never going deeper than to pink skin. If you get too close to the pink, the goat will have very tender feet for a few days. Below the pink you hit blood. This is not good, but will happen occasionally.

If the hoof bleeds, apply blood stopper if needed. If real deep, you can apply pressure to help it clot. Go easy on this. If it is just some blood, use peroxide or a Bactine-type antiseptic.

If the hoof is spongy and has a very distinct odor, it is likely to be hoof rot. If so, apply Koppertox or similar treatment, (Not on animals that will go for meat! It stays in their system and is poisonous and illegal). We use zinc sulfate in a can or pan, and soak the hoof several times a day for 4 or 5 days. Or, as recent research revealed (1/03 CM) two injections of LA-200 (oxytetracycline).

The objective in hoof trimming is to leave a level surface. You

Photograph by Mickey Nielsen, Liberty Farm, Yakima, WA.

may find this difficult if there are cracks and crevices with dirt in them you must clean out. Do the best you can. The walls of the hoof should be level with the rest of the hoof, in an ideal world.

Trimming the back hooves usually causes the most kicking from the goat. You can make this somewhat easier if you stand facing rearward, behind the goat with the leg pulled up between your legs, resting the hoof on your knee. Again, don't get the leg too high.

The tip of the toes should be trimmed back until you can see white or pink. Be cautious not to trim too far, as this can bleed easily, especially on younger goats.

Once in a while you will come across dewclaws above the hoof that need trimming. Treat them the same, trimming off the excess. We only have 2 or 3 of 100 that need this done at any one time.

Most goats become used to this after a time or two. We give them grain while trimming, as needed to calm them down. If the goat (or hoof trimmer) gets too stressed, take a break. Talk to the goat, offer some grain, and let the unweaned kids in with mom while she gets her nails done.

It ain't that bad!

Web sites with useful hoof trimming information:

http://www.inform.umd.edu/EdRes/Topic/AgrEnv/ndd/4h/THE_DAIRY_GOAT.html
http://ansci1.abc.cornell.edu/4H/meatgoats/meatgoatfs8.htm
http://www.luresext.edu/goats/library/fact_sheets/g03.htm

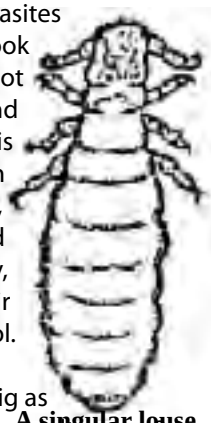
External Parasites of Ruminants
Information from the UN FAO

Excerpt from the Manual for the Primary Animal Health Care Worker, Chapter 3 - Cattle, Sheep, Goats, Buffalo

Ruminants can be infected by several parasites of the skin (external parasites) which feed on the animal's skin and blood. The parasites cause disease, loss of weight, and can lead to death of the animal. The parasites can also carry other infections and spread diseases from one animal to another. Some of these diseases can kill.

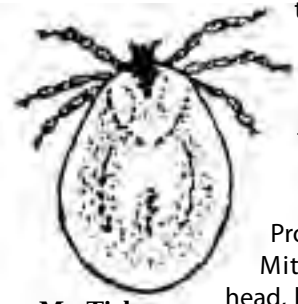
The parasites

All animals and man can be hosts to parasites which live on the skin. These parasites look like insects. Mites are very small and cannot be seen without a microscope. They live and lay their eggs on the skin. Lice (singular is louse) are big enough for you to see. Man can be infected with the head louse. Cattle, buffalo, sheep and goats can be infected with different lice which attack the body, legs or tail region. Lice live and lay their eggs on the skin amongst the hair or wool.



A singular louse

Ticks are bigger than lice and can be as big as a fingernail. Young ticks have 6 legs while adults have 8 legs. All ticks feed on the blood of the host and then drop off onto the pasture. They lay their eggs on the ground. Some ticks live on one host while others may live on two or three different animals throughout their lives.



Mr. Tick

Problems caused by external parasites

Mites cause mange. They infect the head, legs, body or tail region causing the skin to become crusted and cause loss of hair and wool. The infected area itches and the animal scratches. The host does not feed well. The infections cause loss of valuable wool in sheep and damage hides of cattle and goats.

Sometimes young animals become infected with a skin disease called ringworm. Ringworm causes circular, whitish patches on the skin which do not itch. Animals
can have both mange and ringworm and large areas of skin may be affected.

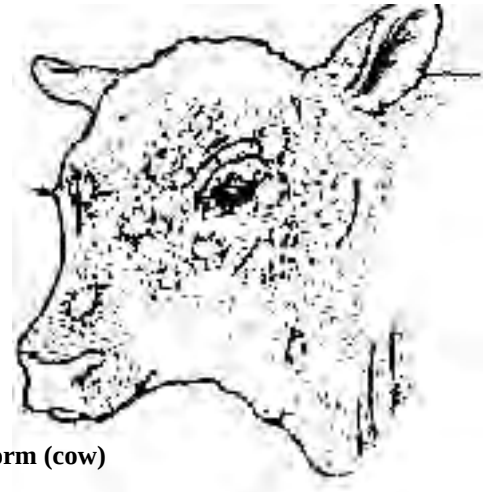
Lice also cause irritation of the skin and the animal scratches, rubs and bites the infected areas. The host loses, or does not gain weight, and looks in poor condition. Both lice and mites can pass from one animal to another. Biting and scratching are the first signs of infection. If you examine the animal you will be able to tell if the skin problem is caused by lice or mites, if lice are on the animal you will find them in its coat, if you do not see any the animal probably has mange caused by mites.

Ticks are very important parasites. They bite the host and suck its blood and when full drop off onto the pasture where they can live for many months without feeding again. Animals can be poisoned or paralysed by the bites of some ticks. Ticks also spread diseases, tick-borne diseases, which can cause death of the host. Ticks cause the loss of meat, wool, milk and leather.

Treatment and control

Mites and lice are controlled by washing the infected area, spraying or dipping the animal with a suitable treatment. All of the flock or herd must be treated to ensure control. Some animals can be infected but show little or no sign of infection and the parasites will spread from them to other animals if they are not treated too.

If an animal has only a few ticks these can be carefully pulled off making sure the mouthparts of the tick are removed. Rubbing ticks with a cloth soaked in kerosene (paraffin) will make them drop off the host. Large numbers of ticks are treated using sprays and dips. It will be necessary to treat all of the herd or flock. Moving animals to different pastures and resting the contaminated pasture for a length of time can help to control the ticks. Cutting the bushes and ploughing the affected area can help to control ticks. Large numbers of ticks can be found around water holes and animal shelters. Keeping poultry in these areas can help to reduce numbers of ticks as the birds will eat them. If mange or ticks are a problem in your community's livestock you should talk to your local veterinarian about it. He will advise you on the best treatment and control to use in your area. He may ask you to collect some ticks or take scrapings of skin from animals with mange so the parasite can be identified. This will help him to decide which treatment you should use.



Ringworm (cow)

Calendar of Events

June 20 - 21, 2003
Black Sheep Gathering, Lane County Fairgrounds, Eugene, Oregon. Wool show & sale, sheep, angora goat and angora rabbit shows, fiber arts competition, workshops, vendors. Info: leslie@fishwhistle.com

June 26 - 29, 2003
Lake Metroparks' Fiberfest '03, Kirtland, Ohio
The Festival June 28 - 29, The Forum (workshops) June 26 - 29, Fiberart Show June 11 - 29.
Vendors, demonstrations, workshops, animals. For information booklet - 800-366-3276
www.lakemetroparks.com

July 1 - 4, 2004
Convergence 2004
Denver, Colorado
Handweavers Guild of America
"Fiber with an Altitude: Connecting People, Connecting Time"
Information: www.weavespindye.org

July 9 - 13, 2003
Creative Strands Fiber Arts Conference, Bucknell University Campus, Lewisburg, PA. Registration materials: 570-473-8278, info@creativestrands.com
www.creativestrands.com

September 30, 2003
ECA cashmere fleece competition, Virginia State Fair, Richmond, VA. Info: Lisa Vailes, 540-885-1261, lvailes@inbio.com. Detailed instructions 5/03 CM, pg 22. Also, workshop on Pasture Management/nutrition by Dr. Joe Tritschler, Extension Animal Scientist, VSU.

October 1, 2003
ECA cashmere goat show, Virginia State Fair, Richmond, Virginia. Show Superintendant: Lisa Vailes, contact information above under September 30th events.

October 4 - 5, 2003
Vermont Sheep & Wool Festival, Essex Junction, Vermont. Sheep & other fiber animals, handspinning and fiber competitions, demonstrations, vendors, exhibits, workshops. Info: Kat Smith, 136 Jack Perry Rd, Wallingford, VT 05773.

October 18 - 19, 2003
NOT 9/18 as printed in the 2003 CM calendar!
New York Sheep and Wool Festival, Rhinebeck, New York, ECA cashmere goat show (10/19), Joe David Ross, Judge. www.sheepandwool.com

Association Contacts

Cashmere America Cooperative
Joe David Ross, Manager, 915-387-6052
fax: 915-387-2642, Email: goat@sonoratx.net
Wes Ackley (Maine) 207-336-2948
Marti Wall (Washington) 360-424-7935

Eastern Cashmere Association (ECA)
Ann Wood, President
937-834-1122, tamarackranch@core.com

North West Cashmere Association (NWCA)
Diana Mullins, President,
509-997-2204, 509-429-0778, dmullins@methow.com
Carol Spencer, Membership Coordinator
503-873-5474, message: 503-873-5511
cspencer@foxmoorfarm.com
Website: http://www.nwcacashmere.org

Pygora Breeders Association (PBA)
Inga Gonzales, Secretary
PO Box 565, Knightsen, CA 94548, 925-625-7869
email: Igonozo@goldstate.net

Texas Cashmere Association (TCA)
William (Bill) Nagel, President
4625 Sandy Fork Rd., Harwood, TX 78632
830-540-4707, email: bnagel@bvtc.com

Mini-Pearl and doe kid Norma Jean, born in January. Little girls grow up fast.

Breeders Directory

CALIFORNIA

CAPRETTE CASHMERE
Barbara Fiorica
13059 Cherry Rd.
Wilton, CA 95693
916-687-6406
ROFIORICA@AOL.COM

CONNOR'S RUN FARM
Pete and Charlotte Rhoads
6300 Lofty View Road
Placerville, CA 95667
530-642-9931
fax: 530-642-9936
email: prhoads@mindspring.com

HENRY LOWMAN
PO Box 2556
El Granada, CA 94018
650-225-1171
email: hlowman@compuserve.com

COLORADO

GOATIQUE
Ann Bertschy
607 County Road 730
Gunnison, CO 81230
970-641-5383
goatique@pcrs.net

JABBERWOCKY FARM
Susanne Roth
408 Cty Rd. 59
Guffey, CO 80820
719-689-9502

K. BULLARD/CHALK
7225 E. County Rd. 18
Loveland, CO 80537
970-667-2999

MARSHALL'S ORGANIC ACRES
9217 N. County Rd. 7
Wellington, CO 80549-1521
970-568-7941
Borganic2@aol.com

MAINE

BESSEY PLACE CASHMERE
Wes and Marilyn Ackley
319 Brock School Road
Buckfield, ME 04220
207-336-2948
ackley@megalink.net

BLACK LOCUST FARM
Yvonne Taylor
PO Box 378
Washington, ME 04574
207-845-2722
yvonne@blacklocust.com

SPRINGTIDE FARM
Peter Goth & Wendy Pieh
PO Box 203
Bremen, ME 04551
207-529-5747
fax: 207-529-5739
wpieh@lincoln.midcoast.com

MARYLAND

MIDDLETOWN FARM
George and Barbara Little
8123 Old Hagerstown Rd.
Middletown, MD 21769
phone & fax: 301-371-8743
glittle640@aol.com

MONTANA

CASTLE CRAGS RANCH
Steve and Diana Hachenberger
894 Pheasant Run
Hamilton, MT 59840
phone & fax:
406-961-3058
cashmere@bitterroot.net

PMF CASHMERE CO.
Ann Dooling
3299 Anderson Lane
Dillon, MT 59725
406-683-5445
ann@montanaknits.com

SMOKE RIDGE CASHMERE
Craig Tucker
Yvonne Zweede-Tucker
2870 Eighth Lane NW
Choteau, MT 59422
406-466-5952
fax: 406-466-5951
smokeridge@marsweb.com

NEVADA

DOUBLE BAR J CASHMERE
Betsy Macfarlan/Jeff Weeks
P.O. Box 150039
Ely, NV 89315
775-742-1189
goatsnsoap@idsely.com

ROYAL CASHMERE
Eileen Cornwell
Byron Higgins
5455 Reno Highway
Fallon, NV 89406
phone & fax: 775-423-3335
cashmere@phonewave.net

NEW HAMPSHIRE

ROKA Farm
Jefferson, NH
Pat Bacon
97 Success Rd
Milan, NH 03588
603-449-6797
mswhmtns21@hotmail.com

NEW YORK

HERMIT POND FARM
Pamela Haendle
10601 Merrill Road
West Edmeston, NY 13485
315-899-7792
hermit@borg.com

MOO'S MEADOW FARM
Judith E. Paul
Springville, NY 14141
716-941-5826
judithepaul@hotmail.com

NORTH CAROLINA

Flying Fiber Farm
Sandra Basel
941 Vanderpool Road
Vilas, NC 28692
828-297-3046
fax: 866-728-4141
FlyingFiberFarm@aol.com

OHIO

HIGH COUNTRY CASHMERE COMPANY
Chris and Kathryn Cooper
12840 Cowan Road
Athens, OH 45701-9539
740-594-3350
email: kcooper@eurekanet.com

TAMARACK RANCH
Bob and Ann Wood
12575 Collins-Arbogast Rd.
South Vienna, OH 45369-9514
937-834-1122
tamarackranch@core.com

OKLAHOMA

TEXOMA KIDS & CASHMERE
J. D. and Karen Chandler
Rt 1, Box 37
Mannsville, OK 73447
580-371-3167
fax: 580-371-9589

Continued on next page

Breeders Directory
Continued from previous page

jkc@flash.net

OREGON

ABORIGINAL FIBRE
razberi kyan (Pat Almond)
PO Box 899
Mulino, OR 97042-0899
503-632-3615
razberi@teleport.com

AYER'S CREEK RANCH
19655 NE Calkins Lane
Newberg, OR 97132
503-554-9260
Linda_Lowell@beavton.k12.or.us

CASHMERE GROVES
Pat Groves
16925 S. Beckman Rd.
Oregon City, OR 97045
503-631-7806
pgroves@ccwebster.net

DUKES VALLEY FIBER FARM
Fran and Joe Mazzara
4207 Sylvester Drive
Hood River, OR 97031
541-354-6186
FMAZZARA@gorge.net

FOXMOOR FARM
Carol and Carrie Spencer
1178 N.E. Victor Point Road
Silverton, OR 97381
Phone: 503-873-5474
Message: 503-873-5511
foxmoorfarm@foxmoorfarm.com

GOAT KNOLL
Paul Johnson/Linda Fox
2280 S. Church Rd.
Dallas, OR 97338
503-623-5194
goatknol@wvi.com

HARVEST MOON FARM
Guy and Karen Triplett
63311 Abbey Road
Bend, OR 97701-9743
541-388-8992
harvest@empnet.com

HAWKS MOUNTAIN PYGORA'S
Lisa Roskopf & George DeGeer
51920 SW Dundee Rd.
Gaston, OR 97119
503-985-3331
Fax: 503-985-3321
lisa@hmrpygoras.com

MCTIMMONDS VALLEY FARM
Janet and Joe Hanus
11440 Kings Valley Hwy.
Monmouth, OR 97361
503-838-4113
janhanus@open.org

ROARING CREEK FARMS
Arlen and Cathy Emmert
27652 Fern Ridge Road
Sweet Home, OR 97386
503-367-6698
cashmere@proaxis.com

PENNSYLVANIA

DANCING HEART FARM
Marc & Cindy Briggs
RD 1 Box 1327A
Russell, PA 16345
814-757-8119
mncbriggs@kinzua.net

TOAD HAVEN FARM
Gloria Rubino
RR 2, Box 2248A
Saylorsburg, PA 18353-9568
570-629-6946
Toadhaven@aol.com

TENNESSEE

CUDROW CASHMERE
Jim & Cindy Crisp
1936 Calderwood Hwy.
Maryville, TN 37801
865-856-5264
CudRowCashmere@msn.com

CUMBERLAND BLUE FARM
Bob and Rita Russo
607 Old Blue Springs Rd
Smithville, TN 37166
615-215-8837
RRUSSO@DTCCOM.NET

TEXAS

JOE DAVID ROSS
Box 645
Sonora, TX 76950

VERMONT

APPLEWOOD FARM
Barbara & Dick Albertini
Post Office Box 168
Underhill Center, VT 05490
802-899-4294
Fax: 802-899-2583
Ralbert315@AOL.COM

VIRGINIA

FOGGY BOTTOM FARM
John and Marilee Williamson
990 Old Hollow Rd
Buchanan, VA 24066-4938
540-254-1628
mhwabc@juno.com

GREENWOOD CASHMERE GOATS AND HIGHLAND CATTLE
Mary and Douglas Waters
163 Zion Hill Road
Fincastle, VA 24090-3668
dooglecw@aol.com

SILVER BRANCH FARM
Chuck and Lisa Vailes
1506 Sangers Lane
Staunton, VA 24401
540-885-1261
crvailes@cfw.com

STONEY CREST FARM
Anne and Roy Repaske
570 Paddy's Cove Lane
Star Tannery, VA 22654
Phone/fax: 540-436-3546
cashmere@shentel.net

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BREEZY MEADOW CASHMERE FARM
Douglas and Roberta Maier
810 Van Wyck Rd.
Bellingham, WA 98226
360-733-6742
fibergoat@earthlink.net

BROOKFIELD FARM
Ian Balsillie/Karen Bean
PO Box 443
Maple Falls, WA 98266
360-599-1469 or
360-715-1604
brookfarm@earthlink.net

LIBERTY FARM (NLF)
Cliff and Mickey Nielsen
5252 Hwy 12
Yakima, WA 98908
509-965-3708
mnielsen7@aol.com

SHEA LORE RANCH
Jeremiah and Nancy Shea
4652 S. Palouse River Rd.
Colfax, WA 99111-8768
Phone: 509-397-2804

STILL WATERS CASHMERE
Moon and Diana Mullins
PO Box 1265
Twisp, WA 98856
509-997-2204
509-429-0778
dmullins@methow.com

Internet listing of these breeders and a link to their email addresses and homepages, can be found on the internet at:

http://www.cashmirror.com/breeders.htm

Web Stuff—Web Sites of Interest

Oregon State forages and fencing—nationally known page
http://forages.orst.edu/default.cfm

Writers Weekly.com
http://www.writersmarkets.com/warnings/cashmere.html

CNN report on weed-eating goats
http://www.cnn.com/2003/US/West/05/14/offbeat.goats.reut/

AlltheWeb great search engine
http://www.alltheweb.com/

Google, my favorite search engine, can be greatly customized. I use the tool bar. Also can translate most languages, including Klingon (I kid you not).
http://www.google.com/options/index.html

Dogpile—An old reliable meta-search engine. It searches the search sites! (You "fetch" instead of "search")
http://www.dogpile.com

Spybot—A first class and highly recommended remover of spy 'bots and other sneaky stuff some sites leave on your computer , a free download. Yes, it's from Germany.
http://security.kolla.de/

Ad aware 6.0, another great one.
http://download.com.com/3000-2094-10045910.html?legacy=cnet
Or (be sure to get free version!)
http://www.lavasoftusa.com/

Vivisimo Search does document clustering, very handy. Seperates into useful categories
http://vivisimo.com/

Teoma is a new one that offers "refinements" (categories).
http://www.teoma.com/

Viruses and worms—There are some really bad worms and viruses today. Check your computer free at Symantec's site. All our email is scanned by our virus protector before emailing. We have received four virus attacks in the last week alone. Get a firewall and anti-virus software.
http://securityresponse.symantec.com/

Free firewall and it's a good one from Zonealarm. I use the Pro edition.
http://www.zonelabs.com

Direct link up with my web picks:
I have create a new web page on our website so you can just "click" on these links. Look for Paul's Monthly Web Picks link on http://www.cashmirror.com

Classified Advertising

CashMirror Back issues, $3 each or a dozen for $30. 10/89 - 3/03. About half of old issues still available. Index available. Great reference material. Order from CashMirror Publications. Price includes shipping.

Children's Book: Buster the Cashmere Goat, Children's book by Paul G. Johnson, CM Ace Reporter. 66 pages, includes photographs. Good goat fun. Suitable for reading aloud for young children, 4th grade readers, or for brightening lives of bored adults. Happy endings only. $7.50. Order from CashMirror Publications. Check out Buster's web page (a *goat* has a web page???) http://buster.cashmeregoat.net

Maremma Sheepdog Club of America, Maremma Livestock Guarding dogs, PO Box 546, Lake Odessa, MI 48849, 616-374-7209. Free information and Breeder Directory.

Yocom-McColl Testing Laboratories, Inc. for indivdual animal and core testing. Ph: (303) 294-0582,
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Website: http://www.ymcoll.com

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...Smith & Sherman, Goat Medicine

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... Dr. An Peischel, UC Davis

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...M Furfur, MD

"Power corrupts. Absolute power is kind of neat."

...John Lehman, Secretary of the Navy (1981-1987)

The Deadlines:

Articles, photographs, advertising and other information submitted must be received by the 25th of the month prior to magazine issue date.

If you need assistance designing or laying out a display ad, or fine-tuning an article, earlier is appreciated.

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