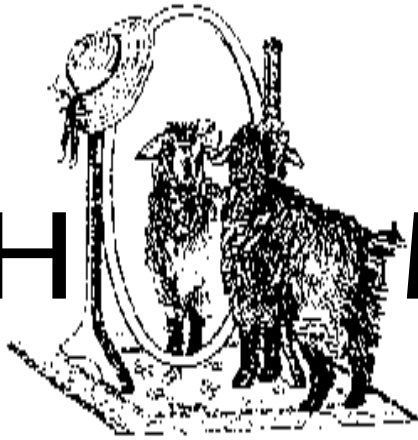


CASHMIRROR



January 2003

Volume 14, Issue 1

The monthly magazine devoted to cashmere goats and their fiber



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CASHMIRROR

ISSN 1090-736X

Boring (Yet Important) Technical Information

This magazine is published each and every month (eventually) by:

CashMirror Publications

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Dallas, Oregon 97338
503-623-5194

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Cover photo: Linda Fox
"Venturing Out"

Day 3: New kids and mom venture out of the kidding stall.

Dog Biscuit Taste Test

A *CashMirror* (Semi-Scientific) Study

By Linda Fox

Introduction

This study started out as an idea for Christmas presents for family members. Most of our relatives foolishly own dogs instead of goats, so we thought we would find recipes for dog biscuits, bake them and give them as gifts. In order to decide which recipe to use, we decided we would make up one batch of each of three recipes and offer them to our own four dogs. Their preferences would determine which recipe we used for our Christmas gifts. And then the idea hit us—If we took extra care in our experiment design and implementation, we could be just like the real scientists and have valuable information to pass on to others. Maybe we could even apply for Federal funding! Also, if all else failed, we might still have a good story for CashMirror.

Materials and Methods

There are many web sites with recipes for dog treats. We selected three different recipes—at random—well, actually it wasn't totally random—it was more like the first recipes we came across that we had the ingredients for. The recipes we used are on page 21. The first was a vegetarian recipe (Veg) which sounded healthy, yet edible. It contained carrots and juice from cooked carrots. These looked and smelled tasty while baking and would be especially good if your dog was of a vegetarian persuasion. The second recipe featured peanut butter, honey and rolled oats (PB&H). It seemed to be a sweeter dough and might be preferred by owners as a "treat" rather than substantial dog food. They smelled like cookies as they baked. The third recipe (Liv) is for the "real dog"—it contained liver bits. We boiled a bag of chicken livers, mashed the cooked meat into bits with a potato masher and added the liver-flavored cooking water as well as the rest of the carrot juice to the recipe. Their production made the house smell like liver, but they looked healthy (for a dog) as they cooled on the cookie racks on the counter.

We made all the biscuits the same shape and size, using a bone-shaped cookie cutter. We didn't want the dogs making their selection based on shape of the biscuit rather than the taste or nutritional value.

We packed our samples into carefully-labelled plastic zip lock bags, assembled our camera and clipboard and headed out to the test area.

Subject number one (Jill) was waiting on the front porch. We knew Subject number one would be a "hard sell" for any dog biscuit. She routinely buries any purchased dog biscuits and never returns to them. We stopped offering her dog biscuits a long time ago. We lined up three biscuits on the porch. Without taking time to even sniff all three, she ate 1/2 of the PB&H and snatched the Veg to eat in the middle of the rose bed. She then returned, ate the rest of the PB&H and took away the Liv to eat—or did she bury part/all of it? We lost sight of her and



Test subject number one prefers Peanut Butter & Honey.



Subject number two preferred the Liver biscuits—at first.



Subject number three seemed to prefer Vegetarian Biscuits—or the whole bag of biscuits off the table.

Continued on page 20

Reflections

by **Linda Fox**

Selecting a Spinning Wheel

Last Saturday I travelled with a friend to Woodland Woolworks (Carlton, Oregon) to help her select her first spinning wheel. I knew that her selection would probably not be easy. She is just learning to spin and is anxious to get up to speed quickly so that she can begin spinning the cashmere to be combed from her goats' first harvest this spring. Woodland Woolworks has a large array of spinning wheel choices and knowledgeable sales staff to answer every question. I have been spinning long enough to know that almost every well-adjusted wheel will spin almost anything and that a spinner's wheel of choice is determined by many non-functional preferences.

When I learned to spin, about seven years ago, I borrowed an Ashford Traveller from a spinning sister. She gave me a few brief tips on how to get started and told me I could use her wheel as long as I needed it. I spun on it for a few months and then, feeling guilty that I had absconded her only wheel, decided to purchase my own. I felt that I still didn't know enough about spinning to ask the right questions, so I "copped out" and bought something that was relatively basic and inexpensive. I bought an Ashford traditional wheel. Conversations with spinners and internet acquaintances let me know that this basic wheel should meet all the requirements for spinning cashmere yarn, when my spinning skills allowed. I felt confident that when I was a more experienced spinner and knew the right questions to ask, I would purchase the ideal spinning wheel and sell my Ashford to some other beginning spinner who also didn't know the right questions to ask.

Now that I know most of the right questions to ask, I own four spinning wheels and am not inclined to sell any of them. Spinning wheel companies like this.

The factors that influenced my purchasing decisions were:

The look of the wheel—I like a "traditional" look. I want the wheel to look like a tool of bygone days. I don't want to see a hint of plastic, velcro or other modern product on my wheel. In fact, my ideal wheel, which I haven't found yet, would be a genuine antique wheel, which still looks new and is in perfect running condition. I'm not willing to give up functionality for looks, but I'd rather not have one of those smooth-lined new-fangled looking devices. My spinning wheel is also a piece of furniture. I like something that will look good in my living room as it will live there, beside the coffee tables and sofa. Most of my spinning is done in short snippets of time as they become available. I can seldom set aside a block of time to spin—when I would want to get everything out and then put everything away when I'm done. If I waited for an adequate block of time to spin, I would seldom spin at all. My spinning area is always set up and available—inviting me to stop by for a spin, even if I only have five minutes to spare.

Weight and size—I want a smaller size wheel (for at least one wheel) that I can take out. It needs to easily fit in the trunk

or back seat of my car. This wheel should be sturdy enough to withstand damage—or a wheel that I don't care if it gets a few scrapes and bruises along the way. Also, a wheel that goes on the road is likely to be used frequently by people who want to try out spinning, including small children. If you intend to let others try to spin on your wheel, it is good to have a wheel that you don't have to grit your teeth and worry when a beginner is playing with it.

Smooth and noiseless—I want a wheel that works perfectly smoothly with no bumps, catches or rough places. This is essential for spinning lace-weight yarn. I also want a wheel that is quiet. I don't want to hear any reassuring whir or ticking as I spin, even a slight one; I want to hear absolutely nothing. This is probably so I can adequately hear the loud, senseless music on the radio.

So, knowing that many of my criteria are personal issues and most of them are important only to me, I thought they should not be brought out to influence a first time buyer.

Den spent several hours looking at and trying various wheels—Ashford, Lendrum, Louet, Majacraft, Kromski, electric SpinIt (briefly) and others, collecting input from store personnel and several helpful customers. She looked at double and single drives, double and single pedals, whorl ratios, optional flyers, lazy kate options, and numerous other factors. Unlike me, she was sensibly looking for her perfect wheel with her first purchase. She didn't consider it a piece of furniture, didn't care how it would look in her living room, and wasn't worried about a little whirring noise now and then. However, she was concerned that the wheel would adequately spin cashmere or any other fiber she might want to spin. She preferred smooth, functional lines and didn't want a lot of decorative doo-dads which did not contribute to functionality.

She eventually chose a Lendrum folding portable wheel. Woodland said that this is the wheel they sell the most of these days. Den decided that she would not purchase optional flyers for the wheel now, but would wait until she found them necessary. It's so refreshing to shop with a sensible person—one who knows her mind and does not have a list of foolish criteria to accommodate.

Den spent time yesterday spinning on her new wheel and her last email said that it was working well for her. She also noted that "And after all that talk about looks, I thought last night that the wheel looks awfully good in my living room."

Alert! Exotic Newcastle Disease (END) Spreads from California to Nevada

NEWS RELEASE, Friday, January 17, 2003, Texas Animal Health Commission Box 12966 * Austin, Texas 78711 * (800) 550-8242 * FAX (512) 719-0719 James Lenarduzzi, DVM * Acting Executive Director For info, contact Carla Everett, information officer, at 1-800-550-8242, ext. 710, or ceverett@tahc.state.tx.us

Nevada officials Thursday afternoon announced that Exotic Newcastle Disease (END), a foreign animal disease deadly to birds and poultry, has been confirmed in a flock of 30 chickens near Las Vegas. Since October 2002, when it was detected in the U.S., the outbreak of this highly contagious viral disease had been confined to Southern California. Animal health officials are warning bird and poultry owners to comply with movement prohibitions on birds and related products from the quarantined areas in California and Nevada.

"The U.S. Department of Agriculture (USDA) on Thursday quarantined Nevada's Clark County, where Las Vegas is located, and portions of adjacent Nye County. Fortunately, Nevada has no commercial poultry operations, so this disease situation may be limited," said Dr. James Lenarduzzi, acting executive director for the Texas Animal Health Commission, Texas' livestock and poultry health regulatory agency. "To stop the spread of disease, state and federal regulatory personnel have imposed restrictions on the movement of birds and poultry products in an affected area. END-infected and exposed birds and flocks must be euthanized and disposed of properly. The premises then must be thoroughly cleaned and disinfected to ensure the virus has been killed."

A task force of more than 700 state and federal animal health employees from across the country are battling END in Southern California, where the federal quarantine has been expanded to eight counties, explained Dr. Lenarduzzi. Nearly 1,250 noncommercial flocks and five commercial poultry operations in this area have been infected or exposed to END. As of mid-January, he said more than 150,000 birds have been euthanized, and another 1.5 million birds are slated for depopulation.

Southern California counties currently included in the quarantine area are Imperial, Los Angeles, Orange, Riverside, San Bernadino, Santa Barbara, San Diego and Ventura. About 4,800 commercial and noncommercial flocks in this area remain under quarantine and will be checked for END.

"END does not pose a threat to humans or to food, but it is a foreign animal disease that is deadly for nearly all species of birds," said Dr. Lenarduzzi, "END likely was initially introduced into Southern California through illegal importation of infected birds."

END-infected birds may sneeze, gasp for air, or cough, and develop muscular tremors or paralysis. While some birds may have greenish, watery diarrhea, other infected birds may show no signs prior to death.

"Infected birds can spread the virus through their droppings or by secretions from their nose, mouth or eyes," said Dr. Lenarduzzi. "In mild weather, the virus can stay alive on surfaces for several weeks and can be carried to new sites on contaminated shoes, clothing, equipment, trucks, manure or even feathers. That is why bird and poultry movement is prohibited from the quarantine zone, and trucks, equipment and other items must be disinfected prior to movement."

In addition to complying with movement restrictions, Dr. Lenarduzzi said bird and poultry owners can protect their flocks by practicing good biosecurity. He advised bird owners to:

- * Report unusual death losses or illness in the flock. In Texas, owners should call their veterinarian, or the Texas Animal Health Commission, which takes emergency calls 24 hours a day, at 1-800-550-8242.
- * Don't keep pet birds on commercial poultry operations. Employees must not maintain their own birds or poultry, as they could carry bacteria or viruses from their birds to the commercial flock.
- * Disinfect tires and the undercarriages of all vehicles as they enter or leave the farm or premise (no 'germs in,' no 'germs out').
- * Disinfect footwear prior to entering or leaving poultry houses. Wear clean clothes when working with birds.
- * Avoid visiting other poultry operations. Dangerous bacteria and viruses can be transported from one farm to another
- * Know the health status of the flocks when buying new birds. Keep new birds segregated for 30 days prior to adding them to a flock.
- * Maintain good records on purchases and sales. If a disease problem arises, these documents can help animal health officials track and eradicate disease.

"If a disease problem occurs in your flock, don't wait to report it," said Dr. Lenarduzzi. "END can spread like wildfire, and what we don't know could jeopardize the Texas poultry industry that employs more than 14,000 Texans and has an economic impact of nearly \$4 billion a year. END threatens everyone in the poultry and bird industry, whether it's a commercial operator, hobbyist and pet bird owner. Everyone must comply with quarantines, watch for disease and report unusual illness or death loss among birds or flocks."

Continued on next page

Newcastle Alert

Continued from previous page

Editor's Note to Newcastle

I hear some of you saying "I read through that entire article about Newcastle waiting to find any little reference to goats, got clear to the end, and zippo! nothing! Why do they do this to me? I asked our illustrious Publisher this question, just so you could have the answer from the top. He said (without any pause at all), "Cuz, we found it interesting."

Since this answer wasn't quite what I expected from someone of his stature, I will embellish somewhat (like usual):

We intend to print all the goat-related stuff we run across, focusing as much as possible on fiber goats, primarily cashmere. However, we will also print other items of interest to cashmere goat owners/enthusiasts. We realize that cashmere goat people have many varied interests and since we don't know exactly what they are, we use ourselves as "test subjects"—if we find it interesting or pertinent to our farm, we assume that you might too. In the case of the Newcastle, we find it interesting because we have a few chickens on our place. If they get sick, it won't affect our goats—except maybe the goats will get less attention because we are spending more time with the chickens—but we would certainly want to know what was wrong with our chickens.

And so, now that you've read all this, you're probably saying, "Paul's answer was just fine; why didn't she just leave it at that?"

There's always a critic in the house!



Three cashmere kids on their favorite climbing toy. Paul—take note—this toy is much more atheistically pleasing than a stack of tires!

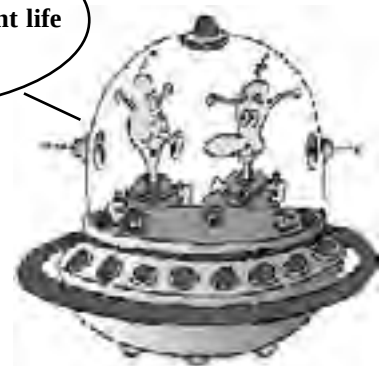


Bud waiting for his troll.

This goat is a pygmy—not cashmere—but he was the Williamsons' first goat

Above photographs by Marilee Williamson, Foggy Bottom Farm, Buchanan, Virginia.

Ernie, look at that! Cashmere goats! There *is* intelligent life on this planet after all!



RESEARCH BRIEF

Location and breed effects on cashmere production by goats

C. J. Lupton, A. R. Dooling, K. Lankford, and F. A. Pfeiffer

Three groups of contemporary, fiber-producing goats representing two genotypes Cashmere (C), higher producing and Spanish (S), lower producing were maintained for three years at three diverse locations in the USA to study the effects of location (environment and local customary management) on cashmere production and fiber characteristics. The initial number of goats was 20 yearling castrate goats/genotype/location. Initially (using yearling weights and fleeces) and within genotype, body weight, raw fleece weight, cashmere yield, cashmere down production, cashmere average fiber diameter, and cashmere average staple length were not different among groups.

The goats were maintained on pasture and supplemented with local hays in an attempt to achieve and maintain target body weights.

The three locations were San Angelo (TX), Dillon (MT), and Willow (AK). Each year, fleeces were shorn before the commencement of shedding in January (TX), March (MT), and April (AK). Most of the measured traits were affected by location, breed, and year (confounded with age).

The location x breed interaction was significant for two traits (body weight and cashmere production

per unit of body weight; the breed x year interaction was significant for three traits (body weight, scoured yield, and cashmere production per goat); the location x year interaction was significant for more than half the traits; the location x breed x year interaction was significant for one trait (scoured yield).

Only the main effects of location and breed are discussed in this research brief. The main effects of location (Table 1, both genotypes, data from three production years) were: average body weight in AK < MT < TX (68.3, 86.4, and 108.9 lb, respec-

tively, $P < 0.0001$); average raw fleece weight in AK < MT = TX (0.98, 1.08, and 1.13 lb, respectively, $P < 0.005$); average cashmere yield in AK > MT > TX (27.3, 21.3, 17.4 %, respectively, $P < 0.0001$); average cashmere down production in AK > MT > TX (0.004, 0.003, and 0.002 lb/lb BW, respectively, $P < 0.0001$); average cashmere diameter in AK = MT < TX (17.3, 17.4, and 18.6 μm , respectively, $P < 0.0001$); and average cashmere staple length in AK = MT > TX (3.0, 2.8, and 2.5 in, respectively ($P < 0.0001$).

Continued on next page

Table 1. Main effects of location on body weight, cashmere production, and fiber characteristics of two breeds of goat

	Alaska	Montana	Texas	SE
N	73	133	122	
Body weight, lb	68.3 ^c	86.4 ^b	108.9 ^a	1.8
Raw fleece weight, lb	0.98 ^b	1.08 ^a	1.13 ^a	0.03
Scoured yield, %	92.4 ^b	92.5 ^b	95.0 ^a	0.3
Clean fleece weight, lb	0.91 ^b	1.00 ^a	1.07 ^a	0.03
Cashmere yield, %	27.3 ^a	21.3 ^b	17.4 ^c	0.9
Cashmere weight, lb/goat	0.25 ^a	0.22 ^b	0.19 ^c	0.01
Cashmere weight, lb/lb BW	0.004 ^a	0.003 ^b	0.002 ^c	0.0002
Guard hair weight, lb/goat	0.65 ^c	0.78 ^b	0.89 ^a	0.02
Guard hair weight, lb/lb BW	0.010 ^a	0.009 ^a	0.008 ^b	0.0003
Cashmere fiber diameter, μm	17.3 ^b	17.4 ^b	18.6 ^a	0.1
SD, μm	3.7 ^b	3.6 ^b	3.9 ^a	0.03
CV, %	21.7 ^a	21.1 ^b	21.0 ^b	0.2
Guard hair staple length, in	3.3 ^a	3.1 ^{a,b}	3.0 ^b	0.08
SD, in	0.5	0.5	0.5	0.02
CV, %	16.0	15.4	16.4	0.6
Cashmere staple length, in	3.0 ^a	2.8 ^a	2.5 ^b	0.08
SD, in	0.5	0.4	0.4	0.02
CV, %	17.6	17.2	18.4	0.8

^{a,b,c} Within a row, means having different superscripts are different ($P < 0.05$).

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Location and Breed Effects

Continued from previous page

The main effects of breed (Table 2, data from three production years) were: average body weight of C < S (81.8 vs 99.9 lb); average raw fleece weight of C > S (1.19 vs 0.96 lb); average cashmere yield of C > S (24.7 vs 17.5 %); average cashmere down production of C > S (0.004 vs 0.002 lb/lb BW); average cashmere diameter of C and S were not different (17.8 μ m); and average cashmere staple length of C > S (3.0 vs 2.4 in).

This information may assist producers and scientists in this country and abroad to better understand the effects of environment on cashmere production and fiber characteristics.

Table 2. Main effects of breed on body weight, cashmere production, and fiber characteristics of Cashmere and Spanish goats

	Cashmere	Spanish	SE
N	167	161	
Body weight, lb	81.8 ^b	99.9 ^a	2.0
Raw fleece weight, lb	1.19 ^a	0.96 ^b	0.03
Scoured yield, %	92.5 ^b	94.3 ^a	0.2
Clean fleece weight, lb	1.10 ^a	0.91 ^b	0.02
Cashmere yield, %	24.7 ^a	17.5 ^b	0.6
Cashmere weight, lb/goat	0.27 ^a	0.16 ^b	0.01
Cashmere weight, lb/lb BW	0.004 ^a	0.002 ^b	0.0001
Guard hair weight, lb/goat	0.83 ^a	0.75 ^b	0.02
Guard hair weight, lb/lb BW	0.010 ^a	0.008 ^b	0.0002
Cashmere fiber diameter, μ m	17.8	17.8	0.1
SD, μ m	3.8	3.7	0.03
CV, %	21.3	21.0	0.2
Guard hair staple length, in	3.6 ^a	2.7 ^b	0.04
SD, in	0.6 ^a	0.4 ^b	0.02
CV, %	15.9	15.9	0.5
Cashmere staple length, in	3.0 ^a	2.4 ^b	0.04
SD, in	0.5 ^a	0.4 ^b	0.01
CV, %	17.6	17.9	0.6

^{a,b} Within a row, means having different superscripts are different ($P < 0.05$).



Reading the Tails

Flagging—Waving of doe's tail when she's in heat, compared to the batting of eyelashes or the swish of a fan by a Southern Belle.

Kid's wagging tail—the faster the tail is wagging when the kid is drinking, the faster are the gulps of milk from the "faucets".

Tail bent down flat against body—can be a sign that the goat doesn't feel well.

Tail held high and bushed out big and bristly—aggressive stance when "discussing" their position in the pecking order with another goat.

Information from Cathie Keblinger's column, "Reading the Signs: True tales of goat tails," *Goat Rancher*, August 2002.

Goat Foot Rot Infection Clinical Trial

Contributed by Robert M. Thornsberry, DVM, MBA

TNT Cattle Company

2254 Fairview Road, Richland, MO 65556

www.cattle-baron.com

Clinical Trial Design

On April 4, 1995, a clinical trial was initiated at a large goat farm in Missouri. Dr. John Berg from the University of Missouri College of Veterinary Medicine took cultures and tissue samples from a group of Angora goats with clinical cases of severe suppurative interdigital foot infection. These goats were all castrated males weighing about 50 pounds and 10 to 11 months of age. The interdigital infections were wet, pustular, and foul smelling. Extensive tissue damage was apparent with considerable necrotic tissue (see Figure 1). Hoof wall involvement with separation from the underlying lamina was apparent in approximately 10 percent of the clinical cases.

Fifty goats with obvious clinical cases of foot infection were randomly selected from the large group of approximately 100 goats. These 50 goats were randomly assigned to five treatment groups and placed in five separate dry lot pens.

Treatment Group 1 – Control – Base Diet Only

Treatment Group 2 – Base Diet plus Chelated Zn and Mn; Injection – 1.5 milliliters Day 1 and Day 7 – Injections were given subcutaneously under the skin of the mid-neck region

Treatment Group 3 – Base Diet plus Oral Chelated Zn, Mn, Cu and Co.

Treatment Group 4 – Base Diet plus LA-200 Injection (20 mg/Kg) – 5 milliliters Day 1 and Day 7 – Injections were given subcutaneously under the skin of the flank.

Treatment Group 5 – Base Diet plus 300 grams of Chlortetracycline added per ton of Base Diet.

Materials and Methods

Goats were housed under roof in a dry bedded pen of approximately 20 square feet per goat. Goats were fed 1.8 pounds of their respective treatment diet or the base diet per day. Free choice access to fresh water and grass hay was allowed throughout the trial. The base diet provided the following nutritional analysis on a dry matter basis:

Crude Protein	15.4%
TDN	76%
Calcium	.99%
Phosphorus	.42%
Copper	15ppm
Manganese	52ppm
Zinc	65ppm

Selenium	.16 ppm
Fat	4.8%
Vitamin A	1173 IU/pound
Vitamin D	173 IU/pound
Vitamin E	7 IU/pound

Treatment Group 2 was injected with a chelated mineral preparation containing 16.2 milligrams of chelated zinc per milliliter and 17.5 mg of chelated manganese per milliliter. The manufacturer recommended 1.5 milliliters be administered subcutaneously at a seven-day interval. The goats in Treatment Group 2 received 1.5 milliliters of the preparation on Day 1 and Day 7 of the clinical trial. This amount of preparation provided 24.3 milligrams of chelated zinc and 26.4 milligrams of chelated manganese per injection.

Treatment Group 3 received the base diet treated to provide the following additional nutrients:

Vitamin A	1475 IU/pound
Vitamin D	908 IU/pound
Vitamin E	20.5 IU/pound
Proteinized Zinc	87 ppm
Proteinized Manganese	43 ppm
Proteinized Copper	22 ppm

Continued on next page



Figure 1: Infected goat foot.

Goat Foot Rot Infection Trial

Continued from previous page

Proteinated Cobalt .20 ppm

These additional nutrients were provided for 14 days of the clinical trial.

Treatment Group 4 received the base diet plus five milliliters of LA-200 (200 milligrams of sustained release oxytetracycline per milliliter) subcutaneously on Day 1 and Day 7 of the clinical trial.

Treatment Group 5 received the base diet treated with 300 grams of chlortetracycline per ton of base feed. The treated feed was provided for 14 days of the clinical trial. With 1.8 pounds of diet intake per goat per day, each goat received 270 milligrams of chlortetracycline orally per day for 14 days.

The feet of every goat in each treatment group were individually examined and the presence or absence of foot infection recorded. The infected feet were characterized by very moist necrotic tissue with exudate present. No feet were individually treated during the duration of the clinical trial. No treatments of any kind were administered to the treatment groups except those outlined in the materials and methods.

Results

On April 17, 1995, the foot of every goat in each treatment group were individually examined and the presence or absence of foot infection recorded. Culture and tissue evaluation results from the University of Missouri College of Veterinary Medicine revealed a typical mixed infection of *Fusobacterium necrophorum* and *Bacteroides (Dichelobacter) nodosus*. On average three infected feet were cultured from each of the treatment groups. The severity of the infections indicated a susceptible goat population without probable previous exposure. The findings of this clinical study indicate that sustained release oxytetracycline injections approximately seven days apart are successful in treating interdigital dermatitis in goats caused by a mixed infection of *Fusobacterium necrophorum* and *Bacteroides (Dichelobacter) nodosus*.

The outcome of this study agrees with the outcome of a similar study reported in the *British Veterinary Journal*¹. Foot infection was induced in 8-month-old lambs by housing them with infected ewes on wet straw. After the foot infection was developed, the lambs were housed in groups on clean dry straw and given no treatment, injected one time with sustained release oxytetracycline (20mg/Kg), or foot bathed for one hour on day 1 and again on day 5 in 10 percent zinc sulfate. Cure rate six weeks later was 1 of 5 control feet, 6 of 6 infected feet in the oxytetracycline group and 2 of 8 infected feet in the zinc sulfate treated feet.

It would appear from this clinical study that sustained release oxytetracycline injections are both practical and efficacious

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for the treatment of caprine infectious interdigital dermatitis caused by a mixed infection of *Fusobacterium necrophorum* and *Bacteroides (Dichelobacter) nodosus*. It is surprising that oral treatment with chlortetracycline did not provide any evidence of treatment of the interdigital foot infections. Each goat in Treatment Group 5 received a total of 3780 milligrams of chlortetracycline during the duration of the clinical trial.

References

1. Grogono, Thomas R., Wilshire, H.A., Simon, A.J., Izzard, K.A. The Use of Long-Acting Oxytetracycline for the Treatment of Ovine Foot Rot, 1994, volume 150, pgs 561-568.



Did I hear someone mention “hoof rot?!”
Helen, Twinkette and their pals are interested in keeping their hoofies dry and hoof-rot free this winter. They are extremely happy to learn that someone has been checking into cures, however!

RESEARCH BRIEF

Location and season effects on mohair production by Angora goats

F.A. Pfeiffer, C.J. Lupton, and A.R. Dooling

Angora goats, which produce long, white, lustrous fibers known as mohair, were introduced into the US from Turkey in 1849. They have since been raised under many diverse environments with mixed results. This experiment was designed to determine effects of two different US environments on mohair production and fiber characteristics. Sixty yearling, castrated goats obtained from a Texas source were shorn so that mohair fleece (6-mo growth) and fiber properties could be determined. Subsequently, 20 relatively uniform goats were assigned to each of two groups such that average body weight (BW), grease fleece weight (GFW), clean yield (CY), clean fleece weight (CFW), clean mohair produced/unit of bodyweight (CFW/BW), average fiber diameter (AFD), average staple length (ASL), and medullation (MED, KEMP, TOTMED) were similar between groups. One group (TX) remained close to San Angelo, Texas, and the other (MT) was re-located to Dillon, Montana. They were maintained on pasture and supplemented with local hays for 3 yr. Each year, animals were shorn and weighed in February or March (Spring) and again in August or

September (Fall) and their fleeces were re-tested. Location x season interactions were significant for all properties measured except CY, AFD, MED, KEMP, and TOTMED. The CY in MT > TX (79.9 vs 76.1%), whereas AFD in MT < TX (32.9 vs 36.0 μm , $P < 0.0001$). The MED, KEMP, and TOTMED were not different (0.85, 0.15, and 1.00 %, respectively, $P > 0.14$) between locations. In MT (Table 1), BW (91.7 vs 71.4 lb), GFW (7.3 vs 4.6 lb), CFW (5.7 vs 3.7 lb), CFW/BW (0.07 vs 0.05 lb/lb), and ASL (5.3 vs 4.1 in) were greater ($P < 0.05$) in Fall than in Spring. Differences are consistent with harsh, cold winters and summers in which abundant feed was available. In contrast, GFW (7.1 vs 8.2 lb) and ASL (4.5 vs 5.2 in) in TX were smaller ($P < 0.05$) in Fall than in Spring. The TX goats had similar ($P > 0.05$) BW (102.7 vs 105.6 lb), CFW (5.5 vs 6.0 lb), CFW/BW (0.06 vs 0.06 lb/lb), and AFD (35.9 vs 36.1 μm) in Fall and Spring. The TX data are consistent with relatively mild winters and harsh, hot summers. The lower production of MT goats was offset to some degree by greater unit value of the finer mohair.

Table 1. Effects of location and season on body weight, mohair production, and fiber characteristics of Angora goats

	Montana		Texas		SE
	Fall	Spring	Fall	Spring	
Bodyweight, kg	41.6 ^b	32.4 ^c	46.6 ^a	47.9 ^a	1.1
Grease fleece weight, kg	3.3 ^b	2.1 ^c	3.2 ^b	3.7 ^a	0.1
Clean yield, %	81.6 ^a	78.3 ^b	79.1 ^b	73.2 ^c	0.8
Clean fleece weight, kg	2.6 ^a	1.7 ^b	2.5 ^a	2.7 ^a	0.1
Mohair production/unit BW, g/kg	65.9 ^a	53.4 ^b	55.2 ^b	56.6 ^b	1.8
Average fiber diameter, μm	32.7 ^b	33.0 ^b	35.9 ^a	36.1 ^a	0.3
SD fiber diameter, μm	8.1 ^b	8.0 ^b	8.5 ^a	8.5 ^a	0.2
CV fiber diameter, %	24.5	24.2	23.6	23.5	0.4
Average staple length, cm	13.5 ^a	10.4 ^c	11.4 ^b	13.3 ^a	0.2
SD staple length, cm	1.3 ^a	1.3 ^a	1.0 ^b	1.3 ^a	0.1
CV Staple length, CM	10.3 ^b	12.2 ^a	8.9 ^b	9.9 ^b	0.6
Total medullated fibers, %	0.9	1.0	0.9	1.1	0.08
Med fibers, %	0.8	0.8	0.8	0.9	0.07
Kemp fibers, %	0.1	0.2	0.1	0.2	0.02

^{a,b,c} Within a row, means having different superscripts are different ($P < 0.05$).

Paul's Web Picks of the Month

Florida Goat Program Website
Florida A&M University Tallahassee, FL
Florida Agricultural and Mechanical University in Tallahassee, FL
http://www.famu.edu/acad/colleges/cesta/goat_program.html
Has several web pages relating to general goat and meat goat subjects. Of interest, although it is not explained, they reference the Florida "Native" goat.

British Goat Society, Goat Health Web page
<http://www.allgoats.org.uk/Goathealth.htm>
Interesting section on "matings", as well as the current UK laws and regulations they have to put up with. This page is kept current!

Cashdown Cashmere, Australia's page on "Shearing Day Summary". Some notes from shearing day, along with other tips.
http://www.cashdown.com.au/shearing_day.html

"The Wicked Stepmother", a goat (well, kind of) story from Kashmir. The plot seems familiar.
<http://www.pitt.edu/~dash/knownles127.html>

The Cashmere Cat Web page. Huh? A fiber store. Wheels, fiber, yarn, you know, that fiber chick stuff. <http://www.cashmerecat.com/>

Not-Quite-Atomic Clock A real must-see!!!!!! Mickey rates it 3 meows.
<http://yugop.com/ver3/stuff/03/fla.html>

Why does this fly have a number?
<http://www.ars.usda.gov/is/np/ha/han13.htm>
LindaBob—see fly.jpg

USDA Feed Outlook page—Beware! It has Pdf's, neat graphs and stuff like my Editor loves. In a nutshell, total feed produc-

tion is down this year.
<http://www.ers.usda.gov/publications/so/view.asp?f=field/fds-bb/>

Sounds of the World's Goats, phonically, by country. They sound different in different countries!?
<http://www.georgetown.edu/faculty/ballc/animals/goat.html>

Robinson Crusoe finds a goat pet! After eating several others, he adopts a kid.
<http://classiclit.about.com/library/bl-etexts/ddefoe/bl-ddefoe-cru-8.htm>

Ag Research Online Survey Chance to win \$100. Right. http://survey.cdmer.com/vrsurvey/ag/ag_oct.htm

New email utility we are trying out, from Canada. Says no viruses. We get hit at least 3X a week with some virus. If this works, along with Norton, Zonealarm, we will actually pay for it.
<http://www.pocomail.com>

Goat Puzzle Online. Also free goat email stationery Springcreek Goat Supplies Playpen.
<http://www.springcreekgoatsupplies.com/PlayPen.htm>

The Goat Drink Recipe—That is, a Drink called Goat. If you dare try it, let me know how it was, assuming you are still able to email.
<http://www.drinksmixer.com/drink120.html>

Chuck's Smokehouse Goat BBQ Recipe.
Who is Chuck?
http://www.cookshack.com/bbq_fun/goat/chucks_smoke-house_smoked_goat.htm

Black Bean and Goat Cheese Chalupitas recipe
Sounds yummy!
<http://www.globalgourmet.com/food/special/1999/janebutel/chalupitas.html>

Tips on Brain-tanning Goat Hides—Three linked pages <http://www.braintan.com/articles/vaughn/goatskin1.html>

If you would like me to email these links to you to make it easier for you to connect, just drop me a line at: paul@cashmirror.com ...Or you can just type them in yourself, one nonsensical letter at a time, knowing that if you type in one little letter or number incorrectly, you'll get a nasty error message. —PJ



I don't know why they numbered a fly...

The Origins of the Domestic Goats

<http://capra.iespana.es/capra/ingles/origen/origen.htm>

A general review of the taxonomical classification is necessary for the understanding of the origins of domestic goats:

Order: Artiodactyla

Artiodactyls are paraxonic, that is, the plane of symmetry of each foot passes between the third and fourth digits. In all species the number of digits is reduced at least by the loss of the first digit, and the second and fifth digits are small in many. The third and fourth digits, however, remain large and bear weight in all artiodactyls. This pattern has earned them their name, Artiodactyla, which means "even-toed". To this order belong: Suidae, Tayassuidae, Hippopotamidae, Camelidae, Tragulidae, Giraffidae, Moschidae, Cervidae, Antilocapridae, Bovidae.

Family: Bovidae

All bovid have horns on their frontals. The skulls of members of this family lack sagittal crests. A postorbital bar defines the rear of the orbit. The lacrimal canals of bovids have a single opening, and it lies within the orbit. Pits in front of the orbits, called preorbital vacuities, are often present.

Bovid cheek teeth are hypsodont (Mammals that feed on abrasive substances are subject to rapid wear on their teeth. Many of these species have especially high-crowned teeth, that is, teeth that extend unusually far above the gum line, providing lots of extra material for wear) and selenodont (large number and large size of enamel cutting surfaces is to elongate the primary cusps in an anterior-posterior direction). The upper incisors are absent. On the lower jaw, three incisors are present on each side of the jaw, and in addition, the canines (usually absent on the upper jaw) are modified to resemble an additional pair of incisors (one on each side). A well-developed diastema separates the lower incisors and the first lower molar-like teeth. The dental formula is $0/3, 0/1, 2-3/3, 3/3 = 30-32$.

All bovids have a four-chambered stomach and digest cellulose through bacterial fermentation.

Tribe: Caprini—that includes different members:

Goat like sheep or sheep like goats:

- Ammotragus lervia (Barbary Sheep)
- Pseudois nayaur (Blue sheep)

Goat-like antelope:

- Oreamnos americanus (Mountain Goat)

Sheep and goats

Genus: Capra (very related to goats are the Hemitragus or Thar, but it has 48 chromosomes, no beard and short horns and stout).

Capra ibex: the main species are:

Differences Between Sheep and Goats

Goats

60 chromosomes
Presence of beard
Presence of face and caudal glands
Absence of foot glands
Tail held up

Sheep

54 chromosomes
Absence of beard
Absence of face and caudal glands
Presence of foot glands
Tail hanging down

Capra ibex ibex or Alpine ibex was hunted to extinction in Switzerland (1800-1850), Germany and Austria (1720) and remained only in the Gran paradiso park in Aosta (Italy), and from there it was successfully reintroduced into the other alpine countries starting with Switzerland in 1911.

Capra ibex nubiana: it is located in the rocky deserts of Judea (Israel), the hills of the Red Sea coast (Egypt and Sudan), Sinai and Arabia. It's endangered by hunting. There are certain pictures that suggest it was domesticated by the ancient Egyptians. There is no relation between this ibex and the Nubian breed that was formed by grading up of native English goats with lop eared goats from the east (Zaraibi, Jamnapari and Chitral from Pakistan).



Capra pyrenaica or Spanish ibex: it resembles the tur (Capra cylindricornis) but the horns have a sharp inner edge and the front is marked by knots like the ibex. It was nearly extinct in the early 20th century but by careful conservation its number have now risen in the national reserve in Sierra de Gredos.

There are subspecies:

Capra pyrenaica victoriae: located in the center in the national reserve in Sierra de Gredos.

Capra pyrenaica hispanica: located in the south in Sierra Nevada.

Capra pyrenaica pyrenaica: it was extinct in January 2000 when the last female died. There is an ambitious project for cloning the DNA material of this animal.

Capra pyrenaica lusitana: it was the Portuguese subspecies but became extinct in 1892.

Capra caucásica (west Caucasian tur) and Capra cylindricor-



Capra Pyrenaica hispanica

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Capra pyrenaica
pyrenaica: it was extinct in January 2000 when the last female died. There is an ambitious project for cloning the DNA material of this animal.

Capra pyrenaica lusitana: it was the Portuguese subspecies but became extinct in 1892.

Capra caucásica (west Caucasian tur) and *Capra cylindricornis* (east Caucasian tur or Kuban): it is a heavily built animal with a dull brown coat and massive horns, almost circular in cross section.



Capra caucásica



Capra cylindricornis

Capra falconeri or markhor (from the Persian "snake eater"): The range of the markhor has historically extended from Turkmenistan, Uzbekistan and Tajikistan to Afghanistan, Pakistan and northern India (Kashmir), in the sparsely wooded mountainous regions in the western Himalayas at an elevation of 600-3,600 m. Within this area, markhor populations are usually very small (<100 individuals) and isolated from each other. The number of animals is dramatically reduced. The main characteristic is the presence of tightly curled, corkscrew-like horns in both sexes, starting close together at the head, but spreading towards the tips. They are supposed to be the angora goats' ancestors. To this species belongs the following subspecies, depending on the spiral form in the horns:

Capra falconeri falconeri: very wide spiral

Capra falconeri cashmirensis: slightly closer spiral

Capra falconeri megaceros: nearly straight and closer spiral

Capra falconeri jerdoni: vertical straight, like the thread of a screw

Capra aegagrus: is the wild progenitor of the domestic goats that belong to the *Capra hircus* species. It's known as *bezoar* or *pasan*, derived from the Persian.

Bezoar meaning counter poison, because in the savage animals it's possible to find a concrete in the stomach with believed to be an antidote. *Pazan* is the Persian word for the mountain goat. It is located in Iran, Turkey, southern Caucasus, southern Turkmenistan, western Afghanistan and some Greek Islands. The main characteristic of the species is the long saber or scimitar shaped horns.

Capra aegagrus



The origins of the *Capra hircus* or domestic goats are uncertain, but archeological evidence suggests it was probably domesticated in the Fertile Crescent 10,000 years ago. It was probably the first ruminant to be domesticated because the wild goat was present in those regions of South West Asia where the agriculture was developing. Herds of wild goats (*Capra aegagrus*) and the Nubian ibex (*Capra ibex*) native to the canyon system comprised a resource crucial to the Nabataean population of Beidha. Byrd (1989:81) reported that caprines were the two best represented species in the faunal collections retrieved during archaeological excavations of the Nabataean component of the site. The exact percentages of each species are difficult to determine, because it is very difficult to distinguish between the bones of these species. (Despite these anatomical similarities, *Capra aegagrus* was eventually domesticated while *Capra ibex* was not.) The earliest unambiguous fossil evidence of domestic goats was found in southwest Iran dating 9,000 years ago and in the Iranian plateau dating 10,000 years ago.

To help understand the origin and the phylogenetic history (see chart on next page) of the domestic goats, G.Luikart et al.* sequenced in 407 goats: a hypervariable segment of mtDNA of 80 breeds worldwide and Y-chromosome DNA of all wild goats and 54 domestic, to assess the paternal origins.

The results were:

- The sequences were very polymorphic: 331 goat mtDNA types.

- The 331 mtDNA types fall into three highly divergent clusters (*Capra hircus*1 found in 371 individuals, *C. hircus*2 found in 25 individuals and *C. hircus*3 found in 11 individuals).

- *C. aegagrus* was considered the wild progenitor of the *C. hircus* because one mtDNA control region differs by only 61,3 nucleotides sites (on average) from the *C. hircus*3 sequences.

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from one common progenitor) and not paraphyletic (the wild *Capra* not cluster between the three lineages).

Three independent origins from genetically distinct populations: it is supported by: The most recent common ancestor dates between 201,380 - 281,932 years ago and this is long before the domestication time. This rather suggests that the three lineages arose from several populations. The *C. hircus* 2 and 3 probably arose in Asia during a secondary domestication or secondary introgression from wild species. In Europe the domestic goats came from the south west Asia already domesticated, because there were no wild goats—only ibex, except for Crete and other Greek islands.

Scimitar horned goats are commonly found in the early Neolithic Swiss lake-dwellings, north east Yugoslavia and Hungary; in the middle Neolithic goats with twisted horns became more frequent in central and eastern Europe. In the Bronze Age this became dominant in Austria and Germany but scimitar horns remained in Switzerland, Hungary and Scandinavia.

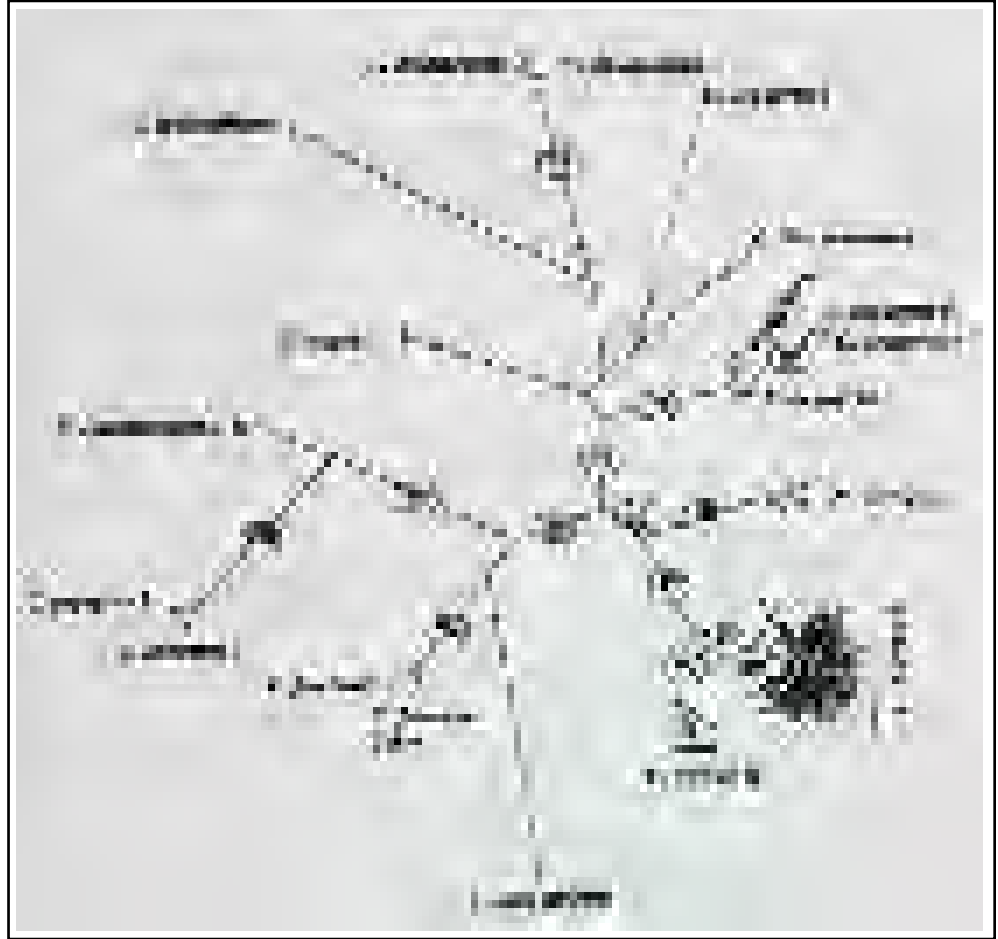
In Greece both types of horns are represented in coins and seals. The first polled goat appears during the Roman empire. The twisted and scimitar type occur in the modern breeds with predominate moderate twist.

True corkscrew horns are founded in the Agrigentana breed from Sicily and the Ulokeros of Greece. Some of the Spanish breeds resemble the wild bezoar (Murciana, Malagueña) and the differences in the horns (*Pirenaica* and *Verata*) are due to genetic selection. In the breeds with twisted horns (*Blanca Celtibérica*, *Blanca Andaluza* and *Canary*) there is influence of the falconery type.

This work is based on:

7th International Conference of goats 15-18 May Tours, France.
*G. Luckart, L. Gielly, L. Excoffier, V. Curry, N. Pidancier, J. Bouvet, P. Taberlet. "Origins and phylogenetic history of domestic goats"

Goat production. C. Gall. Academic Press 1981. Producción de caprinos. Santos I. Arbiza Aguirre.



Phylogenetic History of Domestic Goats

AGT EDITOR, S.A.

<http://www.worldzoo.org/abstract/Abs79007.htm#8.0>: list of the wild goats of the zoos

<http://animaldiversity.ummz.umich.edu/chordata/mammalia/artiodactyla.html> : artiodactyla characteristics

http://news.bbc.co.uk/1/hi/english/sci/tech/newsid_598000/598799.stm: article of the last *capra pyrenaica pyrenaica*

<http://www.funet.fi/pub/sci/bio/life/mammalia/artiodactyla/bovidae/capra/>: classification of the bovidae

<http://www.mtnviewfarms.com/html/alpineibex.htm> : characteristics of the alpine ibex

http://www.findarticles.com/m1200/15_157/62052381/p1/article.jhtml; article about domestication

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<http://www.ultimateungulate.com/artiodactyla.html#Bovidae>:
information about the family Bovidae and their components

<http://www.culturalsite.org/ADAJ/Beidha.html>: article about the
archeological research in Beidha related with goat domestication.

Information from Mafalda Impastato Planellas, General Manager of the Spanish and Latin-American Caprine sites: Capra (<http://capra.iespana.es>)

CapraProyecto (<http://CapraProyecto.iespana.es>)

Indian goats breeds CapraIndia
(<http://CapraIndia.iespana.es>)

The author is a Veterinary Doctor (Complutense University in Madrid) and completed Post graduate studies at the Universities of Colorado and Minnesota (USA). She has specialization training courses at the American Breeding Services (USA) and INRA (France). She is former Technology Manager at IDESEA, a company focused in the development and management of caprine projects, and Technology Advisor at ELEUSIS, a Spanish company dedicated to agribusiness and animal nutrition worldwide.

Douglas County, Oregon New Meat Goat Association

Twenty-two goat producers recently organized a new meat goat association in Douglas County, Oregon. Members are from Douglas, Coos, Lane and Jackson counties in Oregon and flock sizes range from two to 500 animals. The organization formed last November and they held their first official meeting on January 2nd. Succeeding meetings are scheduled for the 2nd Thursday of every month, at 7 PM, in Room 310 of the Douglas County Courthouse in Roseburg, Oregon.

The new organization intends to focus on marketing, buying cooperatively and "helping each other out." The Marketing Committee, headed by Cliff Burke, is working on an inventory of members' stock to find out how many does are owned and when and how many kids will be available for sale.

Burke, currently the largest producer in the group, said he currently arranges his goat sales to a meat processing plant in Livingston, California (east of Stockton), but was interested in finding an Oregon processing plant so animals don't have to travel as far. Burke noted that the Hispanic population of Southern California is a strong goat meat market.

For more information about the Douglas County meat Goat Association, contact Marilyn or Cliff Burke at 541-459-1367.

The Index is Coming! The Index is Coming!

The ultimate index, created by Virginia subscriber, Marilee Williamson, is almost ready for prime time.

We've added a couple of issues she was missing and updated for current issues after creation.

Look for instructions—in this very spot—next issue on how to get a copy. We will have it available (probably as a PDF file) from our website and also for the smart people who don't mess with those silly computers—as a free item to be received in the mail for the asking.

Stay tuned!

Dehairing Cashmere by Hand A Method from Spin Off

By Linda Fox

I remember attending a cashmere workshop many years ago presented by Terry Sim, noted Australian cashmere guru. When asked about the relative merits of shearing vs. combing for cashmere harvesting, Terry, without hesitation, said that shearing was the only practical harvesting method. Another attendee interjected that combing was necessary if you intended to hand dehair your cashmere and that she had found hand dehairing cashmere an effective method for processing her fleece into a spinnable product. Terry asked her how many weeks it took her to hand dehair each fleece.

I have also found hand dehairing to be extremely slow. Even though the resulting product is very nice and \$\$ are saved in processing costs, I seldom have time or patience to hand dehair. If you intend to hand dehair, it helps to comb as early as you can, when guard hair content will be less. It also helps to carefully choose which fleeces to hand dehair—some are definitely easier than others due to amount of guard hair and the contrast between the guard hair and down. However, I have found even hand dehairing the easiest of the lot is still danged slow.

In the Fall 2002 issue of Spin Off Magazine, there is an article on page 74 entitled "Dehairing Cashmere Yourself" by Margaret O. Carter, Richardson, Texas. We had intended on actually trying out Margaret's method and reporting on our trials along with her suggestions. Since this hasn't happened (yet), we thought we had better pass along her tips and the reference to you. If anyone does see something different and effective here, please let us know your experience with it and we will be happy to pass it along.

The author dehaired three different fleeces which she describes as:

1. From an Australian genetic line bred specifically for cashmere. The author loved this fleece and reported that her separation method worked well.
2. From a goat developed to produce both fleece and meat. The fleece had a shorter, coarser, less abundant down undercoat. Separation method was worthwhile, but more time-consuming than Fleece number one.
3. The third subject came from the same genetic line as Fleece number two, but the author felt the quality of this fleece was somewhere between the first and the second.

The author reported that she tested various methods for dehairing and finally arrived at a process that works effectively for her. Her instructions for hand dehairing are as follows:

Choose a fleece carefully—run your fingers through several be-

fore making your choice. Separation begins with washing. Even though a goat's fleece is fairly clean, you will need to remove particles of vegetation and dander along with the ordinary dirt. Some of the undesirables will be removed during the washing process; the rest will fall out during carding.

To wash the raw fleece, fill your bathtub with about 4 inches of warm water and squirt in about 1/2 cup of liquid dishwashing detergent. Place a washing frame in the tub—the article contains instructions for building a washing frame—it is fiberglass screen framed with 1" X 4" wood pieces. Drop handfuls of cashmere into the water on top of the washing frame. Press them under the water and swish them around gently.

Guard hairs will have a tendency to float, so skim off as many of these floaters as you can. More guard hairs will float if you keep your layer of cashmere on the frame thin. Don't wash the whole fleece at once. Let the fleece soak for 20-30 minutes and then gently remove the fiber from the water and let it drain. Refill the tub with warm water and immerse the frame to rinse. Swish it around, allowing more guard hairs to float, and skim them off. Soak for another 15-20 minutes.

Then, lift the frame out, allowing it to drain and to dry. As the fleece dries, run your fingers through it several times—guard hairs will stick to your hands.

After the fleece is dry, working in a breeze or in front of a low-speed fan, tease small amounts of the fiber to loosen and remove most of the remaining guard hairs.

Pull a small strand of fiber into a strand the size of a pencil and run your fingers over the strand. This will loosen guard hairs from the strand and your breeze (either natural or artificial) will blow them away. Hold the fiber strand with one hand and use the other to retain the remaining guard hairs. After several strokes, your strand will be free of guard hair.

Carding is the next step. Put on only enough cashmere to barely cover the teeth of your wool cards (the author uses wool cards, not cotton cards). Don't try to do too much at once. Card gently with the teeth barely touching each other; move the fiber from one card to the other several times. Lifting 2" - 3" slabs of the cashmere from the card, remove any remaining guard hairs.

Your cashmere is now carded, guard hair free and ready to spin!

Book Report

By Linda Fox

Women's Work—The First 20,000 Years

By Elizabeth Wayland Barber

Published by W. W. Norton & Company, New York

Well, what do you think women living in 20,000 BC to 0 BC were doing? Besides bearing children to overpopulate the planet? Back in the time when women had all that spare time because they didn't have to cart the kids to those out-of-town soccer games or work in someone else's office or keep the cave looking like a Martha Stewart centerfold? Early women were using their time to spin and weave. This book is a look at women, cloth and society in early cultures. Even though the spinning wheel is relatively new, developed in medieval times (AD 400-1400), the crafts of spinning and weaving are ancient.

At the beginning of the Old Stone Age (Upper Paleolithic) human beings began to go beyond simple stone tools, fire-controlling groups and started to think "out of the box." They produced new inventions at a furious rate. They began to create new tools, sculpt small statues and paint on cave walls. They also found they could twist fibers into string and a new industry was born. No longer limited to nudity, animals skins and scratchy bark skirts (OK, I made the last one up), they discovered cloth.

The earliest evidence presented by the author of the existence of spinning is a small Paleolithic statue discovered at Lespugue, France. The (plump) female figure is carved of bone and is dated at 20,000 BC. She is scantily attired in a skirt made of twisted strings suspended from a hip band—a classic string skirt repeated in various forms in various cultures even in current times.

It is felt that spinning developed in several different early cultures separately, but the more complicated weaving was probably invented only once and then spread with people to other places. Earliest indications of weaving were found at Jarmo, Iraqi Kurdistan, dated at around 7000 BC. Evidence consists of two small clay balls with textile impressions on them.

The author is a weaver and when she was studying Classical and Bronze Age Mediterranean archaeology at college, she noticed that decorations on durable artifacts, like pottery and walls, looked as if they had been copied from typical weaving patterns. This was difficult to scientifically support, as cloth artifacts are rare. Unlike pottery and cave walls, cloth disintegrates fairly quickly under normal circumstances. The author had intended on spending a couple of weeks looking for evidence of ancient textiles to support her theory. Seventeen years later, she published her 450-page book, Prehistoric Textiles (1991). This book traces the history and development of the textile crafts. While researching this book, Barber collected interesting bits of information about the women who produced the

textiles. This newer book, Women's Work (1994), is a collection of these bits of information woven into a wonderful glimpse of the economic and social history of ancient textiles, and the effect on the lives of the women who created them.

Even though other (non-weaving) scholars may have dismissed the history of perishable commodities—like cloth—as unreconstructable, because there is no remaining evidence, the author makes extensive use of other tools to track down evidence from unusual sources to learn more about ancient textiles and the people and societies who created them. Other tools used besides study of available artifacts with newly-developed tools, include linguistic studies, studies of mythology, comparative methods of reconstruction and study of current cultures.

The author has tried to duplicate some of the artifacts on her own loom in order to more fully understand the processes used. The book starts with a fascinating introduction. Barber tells a story of how she and her sister wove a replica of a plaid woolen cloth scrap discovered in the salt mines of Hallstatt, Austria from 800 BC. During the course of the re-creation, they revised their theory on how the cloth had been woven. I would paraphrase their story here, as I found it very illuminating, however, I am not a weaver (yet) and I'm afraid something vital would have been left out in the re-telling. If you're a weaver, you need to read it and I'm sure you will understand.

This book is fascinating even if you are not a weaver. It is a look into early women's lives and early cultures. The first chapter contains basic details of spinning and weaving, so that later references in the book to weaving or spinning tools and procedures will not be unintelligible to the non-fiber reader.

Sometimes I thought the book went a bit far—leading to conclusions beyond the evidence presented—for example, in presenting a case for completing the classic (half-clad and armless) Venus de Milo statue of Aphrodite to hold a spindle and thread (page 237). However, overall, this book is interesting and well-written and I would recommend it to anyone who has an interest in archeology or in the history of spinning, weaving and cloth or an interest in the history of women in general.

Goat People—and Artist!

Shannon Atkinson

*Alshabet Cashmere Goats & Grinning Goat Greetings
Buckfield, Maine*

My first inspiration was a hand drawn card from my grandmother. As a child I was impressed. I drew (and colored) 31 different designs for family and friends one year. I enjoyed doing those, but it was so time consuming. I looked around for color copy machines and at that time it was a lot more than I could afford. I checked out having them printed for me, but that was going to be another cost-prohibitive venture. So I resigned myself to doing a few cards for close family members. I have two sisters who draw their own cards also. We did this for years and cherished each card that we got from each other. (And still have each and every one.)

Now that we are all computerized, the cards have taken on a different look. Still original art work though. I have always done art work. It runs in my family.

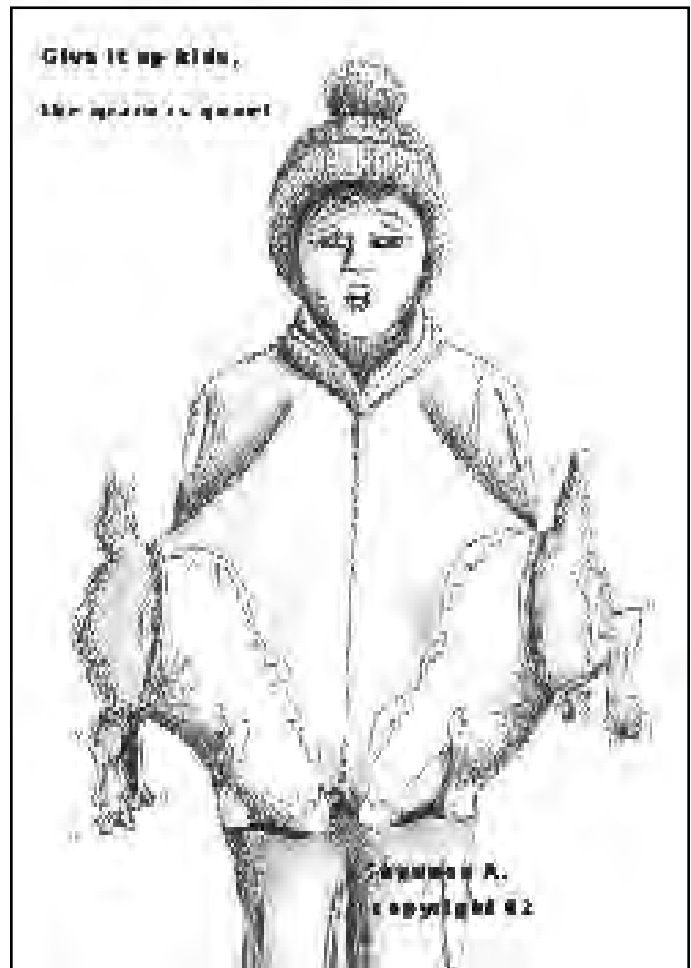
I have a W-I-D-E variety of interests. That's another story... Sometimes it gets a bit frustrating not being able to pursue them all as much as I'd like to... BUT, I'm never bored! I also write short stories of lighthearted events that always seem to happen, especially when raising critters, and being married to a certified "Character." I'm in the process of writing a book of short stories. I have had one poem published also. (Amateur) I have exhibited in many sidewalk art shows over the years and have sold several oil paintings and given many away as gifts.

Designing cards and watching them take on a life of their own is so rewarding. I hope people get as much enjoyment, sending and receiving them, as I get from creating them. They are lovingly called, "Grinning Goat Greetings." I was pleased at the response for my Christmas designs 2002. I have more designs in the works and hope to offer many more items featuring my goat designs. I'm also hoping to offer other animal designs in the near future. (Still keeping the goat designs of course!!) My deepest desire is for everyone to thoroughly enjoy them.

An example of Shannon's marvelous art work is at right and you have seen other examples of her work here and in the ECA newsletter Hoofprints. Shannon offered sets of Christmas greeting cards for sale last December and currently carries a line of other greeting cards featuring goats. In a world of art with too few goats featured, Shannon's products are a great find! To find out more about what Shannon has available, email her at ugotgrl1@megalink.net or contact her at: 417 Bear Pond Rd, Buckfield, Maine 04220



Shannon, Dobie (goat) and Brumbi, alias the "Spud". Shannon had to insert Spud electronically as Dobie wouldn't tolerate any close proximity to the "little hoodlum."



Dog Biscuit Research

Continued from page 3

she came back with dirt on her nose. We carefully noted that she had eaten 1/2 of the PB&H, then the Veg, then 1/2 of the PB&H and then the Liv, maybe. We were unsure how to record the order of the half biscuits and the results of the Liv, so we lined up three more biscuits. We watched her retrieve them one by one, the Veg, the PB&H and then the Liv, and bury them all in the back yard. We were unsure whether there was an order here worth noting or if she was just full.

We headed to the barn for the remaining three test subjects. We lined up three biscuits in front of Billy (test subject number 3). OSI (test subject number 2) ran in and stole the Liv. Billy ate the remaining two—first the Veg, then the PB&H—before we could replace the missing selection. Would Billy have chosen the Liv first if it hadn't been swiped? And, if OSI had more time for his snatch, to fully appreciate all the choices, would he have chosen something else first?

While trying to more fully interpret the results of the last test, we placed the three choices in the dog food dish outside the barn door for test subject number 4 (Spotless). Spotless wasn't there so Paul went around the barn to find Spotless and I went to retrieve more biscuits. By the time we found Spotless and checked his dish, all three biscuits were gone. He probably ate them as he doesn't usually bury anything, but we don't know what order. We couldn't figure out a way to monitor which biscuits Spotless ate—he is people wary and it was dark and raining—so we put three more biscuits in Spotless's dish, closed the door and decided to eliminate test subject number 4 from the study.

We turned our attention back to subjects 2 and 3. We locked #2 in a pen so that #3 could make his choices without interruption. We lined up three biscuits on a bench and watched. Even with Liv as a choice, Billy first ate the PB&H, then the Veg. We placed three more biscuits on the bench. Billy ate the Liv and then went to the pen containing subject #2 to see what all the howling was about.

We were concerned that the noise was breaking Billy's concentration, we decided to let #2 out and modify our test to include competition. We lined up three biscuits and watched. Billy took a Veg and OSI selected the PB&H, dropped it beside the bench and then took the Liv. He ate the Liv and then the PB&H from beside the bench.

Three more biscuits showed yet different results. They didn't seem to be competing for biscuit types; they just seemed to eat whatever biscuit was handy. There didn't seem to be any sniffing and rejecting. They just picked up and ate biscuit after biscuit. They would eat whatever biscuits we placed in the test area or grab the full bag of biscuits off the workbench—until they got full and then they weren't interested in any of the choices.

Results and Discussion

Our conclusions are not many—other than we had a good time. It seems that our dogs like dog biscuits—any kind. Paul definitely prefers the PB&H. Further studies could be made to



Test subject number two selects a biscuit.



Subjects number two and three competing for biscuits.

see if other dog breeds choose differently. Perhaps Poodles are more discriminating.

Literature Cited (the biscuit recipes)
<http://www.doggieconnection.com/recipe>
<http://www.gurney.co.uk/pads/bone.htm>

Dog Biscuit Recipes are on the next page

Dog Biscuit Recipes Used In (Semi-Scientific) Study

Vegetarian Dog Biscuits (Veg)

2-1/2 cups flour
3/4 cup powdered milk
1/2 cup vegetable oil
2 tablespoons brown sugar
3/4 cup vegetable broth
1/2 cut carrots (optional)
1 egg

Mix all ingredients and roll out to 1/4" thick. Cut into shapes with cookie cutter or into strips. Place on ungreased cookie sheet. Bake 30 minutes at 300°.

Peanut Butter and Honey Dog Biscuits (PB&H)

3/4 cup flour
1 egg
1 tablespoon honey
1 tablespoon peanut butter
1/4 cup vegetable shortening
1 teaspoon baking soda
1/4 teaspoon salt
1/4 cup rolled oats
1/2 teaspoon vanilla

Heat honey and peanut butter until runny (about 20 seconds in microwave). Mix ingredients together and drop by 1/2 teaspoonful onto cookie sheet and bake at 350° F for 8-10 minutes.

Tasty Treats (Liv)

1 lb. wholemeal flour
3 ounce melted lard
1/2 lb. boiled or braised liver
One stock cube
About 1/2 pint liquid (water, milk, liver or vegetable water)

Finely chop or mince liver and mix with flour and stock cube. Add the rest of the ingredients and mix to a dough and roll out 1/4" thick. Cut into biscuit shapes with cookie cutter. Bake in slow oven until crisp-about 2 hours.

RELATIONSHIPS AMONG FORAGE CHEMISTRY, CHEWING AND RETENTION TIME WITH INTAKE AND DI- GESTIBILITY OF HAY BY GOATS By COLEMAN SAMUEL W, HART S. P, SAHLU T.

Interpretive Summary:

Hay or forage quality is important for marketing, for formulating supplements or for determining expected performance from animals fed the forage. Forage quality is difficult and expensive to assess. For instance, assessment for rate of gain or milk production requires about six animals (cows, goats, or sheep) and four to six weeks of daily feeding. It is very labor intensive.

The chemical composition of forages has been used to predict forage quality with poor to moderate success. In general, the fibrous portion of the forage plant is responsible for the limitations to optimal production and various processes are involved for ruminant animals to eat, chew, digest and use nutrients found in forages.

A series of experiments were conducted with a wide variety of forage types harvested as hay over several levels of maturity to create diversity in forage quality. Each hay was fed to four goats and the amount consumed, nutrients digested, and rate of gain measured. Chemical composition, the amount of time required to chew, and the time required to pass from the gastrointestinal tract was also determined for each hay.

Regression equations were calculated using only hay chemistry, only chewing and passage time, or a combination to predict hay intake and digestibility. The combination of chemistry and processing time gave the best results.

Eighty percent of the variation in dry matter intake and 90% of that in digestibility was accounted for by the explanatory variables. Average daily gain by the goats was moderately (42% of variation) related to digestible dry matter intake by the goats, from which digestible energy intake can be calculated.

For more information about this research project, contact:

SUBTROPICAL AGRICULTURAL
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BROOKSVILLE FL 34605

Email: swcol@mail.ifas.ufl.edu

<http://www.nal.usda.gov/ttic/tektran/data/000012/95/0000129532.html>

Feed Management and the Rumen

Information from the Newfoundland/Labrador Ag Dept.

The ruminant's digestive system is very complex, with the rumen being the most intricate and sensitive part of the system. The ability of the rumen to facilitate the breakdown (digestion) of relatively indigestible materials (cellulose) is amazing. However, this remarkable organ can be a nightmare when mismanaged.

Maintain the Rumen Environment

To get the most out of your sheep and cattle at minimum cost, you must be prepared to supply a consistent ration every day of your animal's life. This does not mean one day you feed brewers grain and corn the next day and then a little bit of dairy ration on the third day. Generally, supplying the same type of hay and grain will provide the consistency that is required for efficient digestion. This is important because in order for the microbes to be productive, rumen pH must hover around 6 or 7. If the rumen becomes more acidic, then these bugs will slow down and digestion of forage and grain will be reduced.

Some Feeding Guidelines

To ensure that your animals have healthy, productive rumens, use the following guidelines:

The ruminant has been designed to consume and digest forage effectively, so feed lots of it. A minimum amount of forage at 1.5 per cent of body weight should be fed to promote good conditions in the rumen. For example, if you have a 130 lb ewe, then a minimum of $(130 \times 1.5/100)$ 1.95 lbs of hay should be fed along with the recommended amount of grain.

Feed hay before grain to ensure that grain is not digested too quickly. Feeding forage creates a fibrous mat in the rumen which traps the grain and increases its digestion time. Cud chewing stimulated by forage also improves rumen environment by increasing flow of saliva which reduces acidity.

Do not feed large quantities of grain to your animals at one time. Large amounts of grain will promote the growth of lactic acid bacteria (starch digesting) which increases the acidity in the rumen (lactic acid is a much stronger acid than acetate or propionate) and slows down the digestive processes. It is recommended that no more than 6 or 7 pounds of grain be given to dairy cows at each feeding. If you are feeding 30 lbs. of grain per day then the grain ration should be divided into five separate feedings. The significance of this recommendation to sheep or beef will be minimal since large quantities of grain are not generally fed.

Do not feed large quantities of finely ground grains. Fine grinding of grain increases the rate of digestion and fermentation and will increase acidity of the rumen, resulting in reduced feed intake.

Exactly

What is a Ruminant?

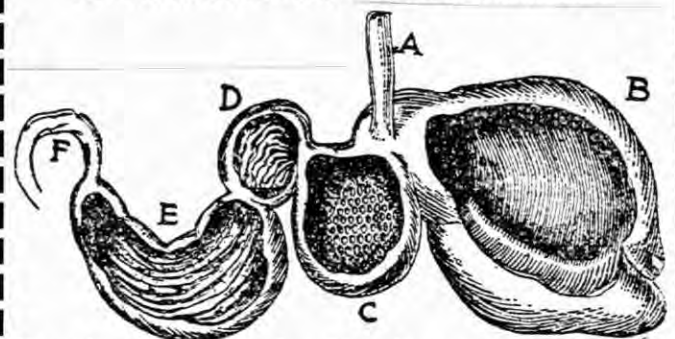
Any of a division – Ruminantia – of even-toed, hoofed mammals including those that chew the cud, as the oxen, sheep, goats, antelopes, giraffes, deer, and camels. The herbaceous food, swallowed partly chewed, passes into the first chamber of the complex stomach, the rumen or the reticulum, whence it is regurgitated in masses and thoroughly masticated and mixed with saliva while the animal is at rest. It is then swallowed and passes through the reticulum and omasum into the abomasum, where it is acted on by gastric juice. *Webster's Second Edition (1951)*

Rations should not be changed abruptly. A sudden change in the type of forages in the ration will also have negative effects. You should consider a 1 to 2 week period to gradually change feeds in your rations. The rumen bugs require this time for adaptation.

Rumen Mismanagement - The Consequences

The computer feeder and total mixed rations have improved the management of the rumen dramatically. Farmers have said that they now have very few animal digestive upsets on the farm. Multiple feeding (at least six per day) have notably improved the rumen environment, but problems still occur. These digestive upsets are not necessarily the result of grain over feeding; it is the abrupt change in forage that seems to be causing more problems. The symptoms are very clear, including reduced feed intakes, loose manure verging on diarrhea, and a significant drop in milk. A change in forage requires an adjustment period so the rumen bugs can adapt. Forages are often different in quality and in the species.

Ruminant Stomachs Illustrated



Complex Stomach of a Ruminant, cut away. A Esophagus; B Rumen; C Reticulum; D Omasum, Psalterium, or Manyplies; E Abomasum; F Intestine.

Calendar of Events

February 8, 2003

OSU/CCCI Pasture workshop

Salem, Oregon, Information: 503-623-8395

February 12, 2003

Oregon State University "All About Goats"

OSU Extension Auditorium, 215 Ringuette Street, Grants Pass, OR

Covers basic care, housing, types of goats, feeding, nutrition, kidding, resources, Cost \$15. Info/Registration: 541-476-6613

April 4 - 6, 2003

Seattle Knitting & Fiber Arts Expo

Seattle Marriott Hotel, Sea-Tac Airport, Seattle, WA

Hand and machine knitting, crocheting, spinning, weaving, beadwork, wearable art classes, vendors, fashion shows, banquets. Contact: Arlene Vraney 425-745-3516, avraney@gte.net or

<http://home1.gte.net/avraney/index.html>

Association Contacts

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Joe David Ross, Manager, 915-387-6052

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Marti Wall (Washington) 360-424-7935

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North West Cashmere Association (NWCA)

Diana Mullins, President,

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Carol Spencer, Membership Coordinator

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cspencer@foxmoorfarm.com

Website: <http://www.nwcacashmere.org>

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Inga Gonzales, Secretary

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Texas Cashmere Association (TCA)

William (Bill) Nagel, President

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2002 Index to *CashMirror* Issues

January 2002

Reflections—Kidding Difficulties, You Know You Are a Goat Farmer When..., Computer Tip for Making the Micron Symbol, Overview of Missouri Goat Industry, Respiratory Diseases, Respiratory Diseases of Show Goats, Holy Goats, Meningeal Worms & Liver Flukes, Goat Owner's Experience with Meningeal Worms, Timeline of Events for Sheep and Goats, Pre/Post Kidding Preparations for Does and Kids, Birth of Arwen, Index to *CashMirror* Issues 2001, Texas Fences Out Colorado Deer and Elk.

February 2002

Reflections—Living Within your Eggs, Scrapie Information from Lincoln University, What is the National Institute for Animal Agriculture?, Scrapie—Information from the National Institute for Animal Agriculture, How to Sell Bald Goats, Scrapie Information—USDA APHIS, Ear Tags for Scrapie Identification, Goat Ranching—Not So Bad, NWCA Meets ECA, Is it a Disease or is it a Parasite?, Kid Shots (Photographs), Do Chickens Have Skins?, The Ligament Test (for Kidding Imminence), Scrapie Eradication News Release.

March 2002

Reflections—Sally, Cashmere 2000, Inc. Reverts to PMF Cashmere Co., Dr. Z Visits Montana Cashmere Ranch, Crossword Puzzle, Chansons de Toile, Progress Report—Management of Hills-Lands in Appalachia for Sustainable Forage and Livestock Productions, What's in a Micron?, Spin a Yarn with Gunnison 4H Club, Goat Farmers Could Profit from Peanuts, Kansas Cattle Negative for FMD, Pennsylvania Researchers Study Goat Milk Cheese, Keeping Cashmere Goats, Origin of the Scottish Cashmere Goat, Fiber Identification by Burning, Uses for Fleece Rejects, Rebuilding Afghanistan's Agriculture.

April 2002

Refractions—A Farm Tale, DNA Preservation from Texas Spanish and Angora Flocks, WTO Can Help World's Poor Farmers, Brief Dehairing News Update, New Technology for New Age Goats—Cashmere De-hairer Revolutionary, US Cashmere Goat Herd Codes, Measuring (Lamb) Waste on the Run, Alternative Livestock Industry—Trends and Disease Issues, Economics of an Australian Commercial Cashmere Goat Enterprise, Weed Control with Vinegar?, Dawson's Niche Strategy Makes Progress, Cashmere Socks (8%), Answers to Crossword Puzzle, Hachenberger Dehairing Survey.

May 2002

Reflections—Opening up the Wild Side, Cashmere Scarf Pattern Alert, New Brochure on Scrapie, Third National Small Farm Conference, Farm Dogs, Cougar Conflict Challenges In Lane County Oregon, Living with Wildlife, Some Goats are Shaped Better than Others (Conformation), Puppy Uppers and Doggy

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Downers, Take a Walk on the Wild Side (photo display), Northwest Cougars, Haemonchus contortus Management Plan for Sheep and Goats in Texas, Chinese Cashmere Market Review, Brief Summary of Basic Goat Care, Where's the Customers, Cougars—Endangered Species in Some Areas, Computer Memory for Dummies, St. John's Wort Miracle Cure, Honey, You Shouldn't Have!

June 2002

Reflections—Fun with Fence, The Art of Fencing, Mending Wall, Internet Addresses for Fencing Info, Fence (Feet)—US Government Code, 17 Mistakes to Avoid with Electric Fencing, Fencing with Power Point, Conductor Comparisons, Managed Grazing Systems and Fencing, Designing a Fence—Tips for Small Acreages in Oregon, International Goat Association 20th Anniversary Celebration, Useful (not really) Information about Computers.

July 2002

Refractions—Buck Feet and Weaning and Other Random Thoughts, Castration of Ruminants, Castration, Castration of Buck Kids, Five (5) Castration Methods, Castration—In Practice (results of reader survey), Goat Gadgets—Goat Trailer, NWCA 2002 Fleece Competition Results, Black Sheep Gathering 2002 (photo display), Cashmere Goat Show at Estes Park Wool Market, The Goats in India, Facts about India, Goats in the Northern Temperate Region of India, Results of (Hachenberger) Dehairing Machine Survey, Hanford Thyroid Disease Study, The West Nile Virus.

August 2002

The Reinstalling Windows Song, Refractions by Mini-Pearl, A Cloned Cat!, Improving Livestock Diet and Nutrition, Alternative Medicine—Definitions, Alternative Medicine for Goats, Treating Livestock with Medicinal Plants: Beneficial or Toxic?, Review of Dr. Duke's Phytochemical and Ethnobotanical Databases, From the Green Pharmacy, Ethnoveterinary Medicine in the Tropics—Key Issues and the Way Forward, Coccidia Infection in Ruminants, Colorado Noxious Weeds, Abscesses, Cysts and Lumps, APHIS Weed Policy, What's New? HiMag Fescue, What's in a Weed?, Contents of Dandelion Greens, Enhancing Goat Production, Forage to Make Taste Buds Tingle.

September 2002

You Know You Are Spending Too Much Time with Your Goats When:, Reflections—Cats With a Purpose, CashMirror Publications Office and Print Shop Photos, Eastern Cashmere Association 2002 Fleece Competition Results, Predation!, Coyotes Kill Sheep/Guard Dogs Guard Sheep, Guard Llamas and Guard Donkeys, Livestock Guard Dogs, Llamas and Donkeys, Livestock Guardian Dogs—Shepherds' Assistants, Emergency Euthanasia of Sheep & Goats, Use of Mixed Breed Dogs as Guardians, Oregon Flock and Fiber Festival 2002 Goat/Sheep Show Results, Oregon Flock and Fiber Festival 2002 Selected Fiber/Fiber Arts

Results.

October 2002

What Good Little Goat Farmer Boys Get for Christmas, Refractions—Winterize Your Goat, Little Quinn—Growing Up, ECA Cashmere Goat Show at Rhinebeck NY, Goats Discovered Coffee, The Capricious Side of the 2002 NY Sheep and Wool Festival, Work Continues to Validate Scrapie Test for International Use, Pan-American Cashmere Goat Show 2002 Results, ECA Goat Show Results 2002 Richmond, Yarn Tips, Cyber Cow Whisperer and Virtual Fence, Cashmere Quality at the Baft Station in Last Two Decades (Iran), Antibiotic Use in Animals.

November 2002

Dieting Tips for the Holidays, Refractions—Wandering Thoughts of a Delusional Publisher, Antimicrobial Drug Use and Veterinary Costs in US Livestock Production, Why is the Internet Slow?, Recipe for GoodDog Biscuits, Goat Gadgets—Doug's New Economy Hay Feeder, Spinning Fine Lace Yarn, Pen-Bonding a Flerd, How to Develop and Manage Contraspacific Livestock Groups (FLERDS), How to Make a Flerd, Beginning Farmer Programs, Sustainable Use of Goats as a Vegetation Management Tool, Goat Production in Nepal.

December 2002

A 2003 Calendar!

Calendar Correction (Already?)

Yup! The error is in May. We have the All Breed Goat Show in Stanwood, Washington, slated for May 27th—a Tuesday, which is clearly incorrect. That goat show will be held on May 17th—a Saturday. This is an important date; you'll want to save it as it will be the date of the 2003 NWCA fleece competition. Also, rumor has it that the famous Wes Ackley of Maine fame will be the judge and workshop instructor. More about this event will follow in later issues and in the NWCA newsletter.

Breeders Directory

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Continued on next page

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Continued from previous page

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Colfax, WA 99111-8768
Phone: 509-397-2804

STILL WATERS

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PO Box 1265
Twisp, WA 98856
509-997-2204
509-429-0778
dmullins@methow.com

BAR-Y

James Barton
PO Box 915
Sonora, TX 76950
915-387-5284
bar-y@sonoratr.net

FOSSIL CREEK FARM

Norman and Carol Self
1077 Cardinal Drive
Bartonville, TX 76226-2620
940-240-0520
fax: 940-240-0204
CWSelf@email.msn.com

VIRGINIA

FOGGY BOTTOM FARM

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

SILVER BRANCH FARM

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

STONEY CREST FARM

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Star Tannery, VA 22654
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Classified Advertising

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 individual animal and core testing. Ph: (303) 294-0582, Fax (303) 295-6944, Email: ymccoll@ymccoll.com Website: <http://www.ymccoll.com>

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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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