

Dr Nora Kravis, DVM

# “The potential of breeding Cashmere Goats in Europe”



# CHIANTI CASHMERE GOAT FARM

## Azienda Agricola La Penisola & Radda in Chianti Siena, ITALY



Cashmere goats are uniquely suited for extensive grazing models, adapting to poor quality pastures, extreme temperatures, and requiring minimum shelter. They thrive in extreme and rugged terrains, and do not impact the environment the way larger and heavier livestock do.

Protein requirements are easily met by access to spontaneous forage, weeds and noxious plants, with minimum integration needed during lactation

Genetic selection and improvement is based on regular fiber evaluation and is the secret to obtaining and improving both the quality and the quantity of the cashmere fiber



Extensive grazing, particularly where there is abundant marginal and abandoned farmland, is proven to be a sustainable alternative to mechanical clearing. Studies of the effects of controlled grazing of cashmere goats on different types of agricultural land (permanent pasture, new pasture, forests and unutilized, abandoned and weed-choked areas) have documented increased biodiversity, improvement of the quality of the soil, and of the percentage of naturally occurring wildflowers and legumes, with consequent **increase in insect and bee populations** \*See document 1



# ICAR 2023 Clearing underbrush



# Genetic selection

Cashmere goats are not considered a true breed due to the fact that other goats can also produce a small of undercoat, or 'down', which can have the characteristics of cashmere

Cashmere goats, in fact, are double-coated goats with two separate hair follicles – the primary hair follicle produces what we call guard hair; the secondary hair follicle produces the cashmere fiber – or undercoat – which is the layer that keeps the animals warm in the winter, and is shed in the spring. That follicle then remains dormant until the end of the warm season when it starts to grow again

This shedding gives us a window of time to harvest the cashmere; in this hemisphere, we usually comb from February through May, using combs



*Contrary to popular opinion, cashmere production depends almost entirely on genetics, and is influenced only marginally by geographic location, climate, and diet*

The principle product of cashmere goats is their fiber, but meat and hides are secondary products that help to integrate the farmer's income. Textile production is the most important added value, and can satisfy numerous artisanal niches, creating local jobs and added income @Km0

When properly harvested and processed, locally produced cashmere (as opposed to imported cashmere from Mongolia and China), can be the source of high-end finished products for the fashion industry that are traceable and ethical – ideal for small-holders in disadvantaged areas.



# HARVESTING CASHMERE

2 year old doe ready to be combed



Cashmere as it is released during combing



# KMO ARTISANAL PRODUCTS

100% SUSTAINABLE CASHMERE YARN



HAND-WOVEN SUSTAINABLE CASHMERE SCARF



# Hand Knitted 100% SUSTAINABLE CASHMERE

Cowl, undyed brown cashmere



Infinity scarf, undyed cashmere



# Results of selective breeding in Italy 1995 to 2023

Our original herd was imported from Scotland in 1995, originating from an experimental farm in Scotland financed by the EU to study the adaptability of Cashmere goats to the European environment

Genetics were improved by live breeding, Artificial Insemination, and Embryo Transfer

Fiber results are monitored continually, with the goal improvement in fiber QUALITY, fiber QUANTITY, and Fiber YIELD and overall adaptability of the goats to our particular environment

Fiber testing is the basis of all our production. Fiber samples are collected annually during combing and sent to the fiber lab at the UNIVERSITÀ DI CAMERINO, in Italy, which utilizes the OFDA 100

Since 1995, we have consistently increased production, lowered fiber diameters and improved overall fiber quality

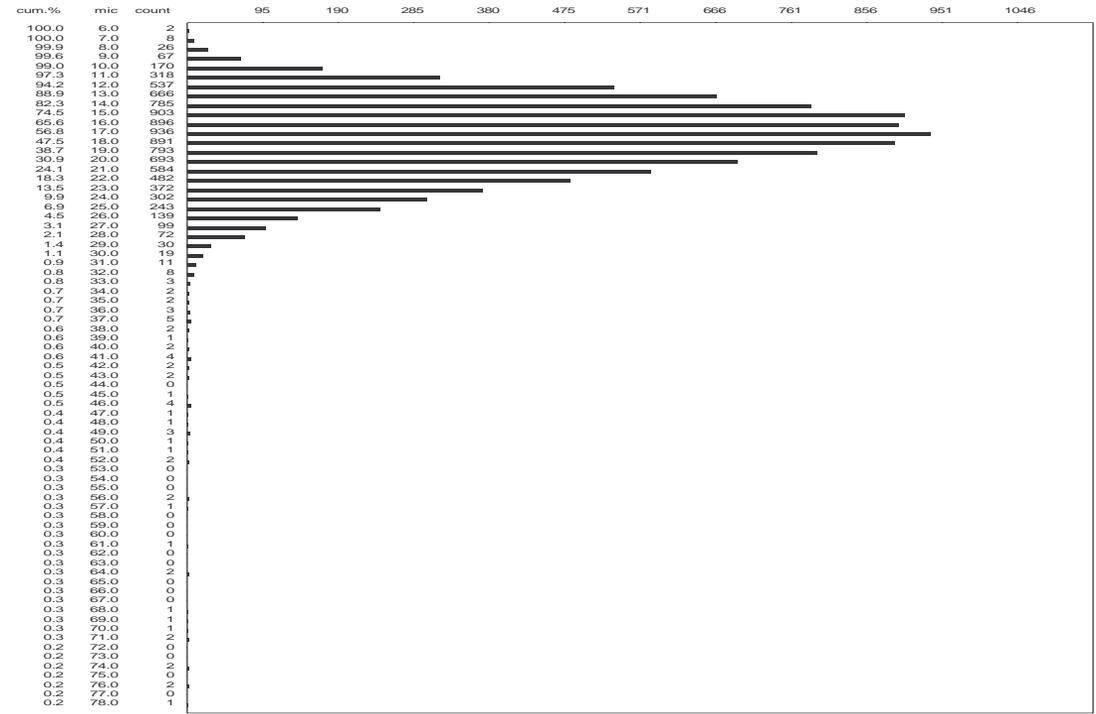
# Individual fiber test of 2 year old buck

CONSORZIO ARIANNE : Diameter Histogram

Date : 29Mar21  
 Sample ID : Budino  
 Description : Cashmere  
 Lot/Client : Kravis\_Nora  
 Operator : Pallotti\_Stefano

Diam = 17.84[6.00] um  
 CV = 33.63 %  
 CEM = 7.95 um  
 CF = 99.05 %  
 Spin fineness = 19.67  
 Sample size = 10129  
 Sample size = 10129

: Cal: D = 0.0000\*WH 0.00  
 Filename: BUDINO.MES



# European Cashmere vs Asian Cashmere

The quality of the cashmere produced in a European environment (and confirmed by our fiber testing and statistics) is equivalent to that produced in the countries such as Mongolia and China, who are the major producers of raw material.

Statistics show that in some areas of Europe as much as 65% of agricultural land has been abandoned over the last 50 years. By grazing cashmere goats we reclaim and improve that land while producing ENVIRONMENTALLY SUSTAINABLE CASHMERE, as opposed to overgrazing and desertification of pastures in Mongolia and China

Producing finished and semi-finished cashmere products creates artisanal work and income in areas that often lack the infrastructure necessary to produce other products.

# EUROPEAN CASHMERE GOAT REGISTRY

Beginning in 2023, we are creating – under the umbrella of the AMERICAN CASHMERE GOAT ASSOCIATION – a stud book, or Registry.

Our first samples are being evaluated as we speak by the University of Camerino. Once the first goats are inserted, we will be opening the Registry to all those interested – only goats that meet the fiber criteria, and are regularly registered with their local Health department, and possess a recognized farm code, will be eligible

Our goal is to identify and certify those Cashmere Goats present in Europe to create a group of breeders committed to increasing the production of fiber excellence. It can be done!

# CASHMERE GOAT ASSOCIATION DATABASE AND REGISTRY

The Cashmere Goat Association ([www.cashmeregoatassociation.org](http://www.cashmeregoatassociation.org)) Database and Registry was developed to serve as a repository for information on goats who meet the qualifications for cashmere goats specified in the North American Cashmere Goat standard. The CGA hopes that the database will:

- Serve as a resource for cashmere goat breeders seeking high quality stock
- Promote continuous improvement in the quality of cashmere goats in North America by recognizing goats meeting the standards
- Serve as a resource for research into breeding approaches and correlations among goat characteristics
- This is an open registry. Each animal must qualify on its own merits, not on those of its parents. The database will also contain basic information on goats that appear in the pedigrees of registered goats, even if they are not registered. Goats that are on the database as "pedigree only" entries will not appear in the List of Registered Goats, but they can be located through the Search by Herd Code and Name.
- The CGA Database and Registry is available to all for online searches for cashmere farms, specific cashmere goats, for cashmere goats in a specific line, and for cashmere goats having user-specified characteristics.

## CGA registry



Email

Passphrase

Login

Continue As Guest

Welcome to the Cashmere Goat Association Database and Cashmere Goat Registry!

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Functions for registering goats and maintaining evaluation data are available to farmers who have defined farms (with herd codes) in the database. Individuals wishing to obtain a herd code or to update information on a farm can contact Pam Haendle at [hermitpond@gmail.com](mailto:hermitpond@gmail.com).



# Samples of Cashmere Goats raised on our farm

LONG-HAIRED 4 YEAR OLD BUCK AMPUTEE 'THE LION KING'



# MEDIUM GUARD HAIR, partially combed in the middlesection



# SHORT-HAIRED 4 YEAR OLD DOE, after combing



# CONCLUSIONS

Cashmere goats are:

- perfectly suitable for extensive grazing schemes
- thrive on locally available forage, with little or no supplements
- resist at extreme temperatures
- raise their young at pasture
- reclaim and improve abandoned farmland
- are hardy, good mothers, and are not prone to many common diseases
- necessitate basic, unsofisticated shelters
- produce raw material for the high-end textile sector
- Ideal for tourist related spin-offs

## CHIANTI CASHMERE GOAT FARM



Our farm breeds and sells Cashmere goats to small and medium farms within and without the EU

We are a closed farm, free of any infectious disease, and the only certified WILDLIFE FRIENDLY AGRICULTURAL ENTERPRISE in Europe

We teach farmers the basics of breeding, harvesting and processing the raw material into sellable, traceable, cruelty-free finished products

Our goats are sold chipped and vaccinated.

If requested, we are in a position to create projects to involve small holders, local artisans, disabled or other minority groups

# Footnotes

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Università degli Studi di Firenze

DOTTORATO DI RICERCA IN

"Sistemi pastorali e foraggero zootecnici sostenibili per il territorio e la qualità dei prodotti"

CICLO XXV°

COORDINATORE Prof.ssa Giovanna Pazzi

Studio sul pascolamento di capre Cashmere come strumento per la gestione sostenibile e la valorizzazione delle aree marginali

Settore Scientifico Disciplinare AGR/19

Dottorando: Dott. Lapo Tardelli

Tutor: Prof.ssa Anna Acciaioli

Anni 2010-2012



Article

## PDGFA in Cashmere Goat: A Motivation for the Hair Follicle Stem Cells to Activate

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**Simple Summary:** Cashmere goats are the most important goat breed due to the high yield and fineness of the fibers that they produce. Cashmere fiber is a luxury product since it is soft, light and warm. The development of this fiber depends on the hair follicle (HF) cyclical activity, which is characterized by the succession of growth and regressive phases. In the transition between telogen and anagen phases, many growth factors work to activate the HF stem cells and to allow the growth of a new cashmere fiber. As several factors involved in the stem cell activation, Platelet-Derived Growth Factor A (PDGFA), Bone Morphogenetic Protein 2 (BMP2) and Lim-Homeobox gene 2 (LHX2) were analyzed in this work to evaluate their activity during the cashmere HF cycle. These molecules were studied using different approaches and finally, PDGFA and BMP2 appeared to have higher levels of expression during the cycle activation phase with respect to the LHX2, which suggests that they play a main role in the development of a new cashmere fiber. The obtained data will improve the knowledge of the HF cycle in the cashmere goat and they could be a useful tool for improving cashmere fiber production.

**Abstract:** The cashmere hair follicle (HF) perpetually goes through cycles of growth, involution and rest. The photoperiod is the main factor in the control of seasonal coat change in cashmere goats while stem cells play a crucial role in the HF growth. Several factors, including Platelet-Derived Growth Factor A (PDGFA), Bone Morphogenetic Protein 2 (BMP2) and Lim-Homeobox gene 2 (LHX2) are implicated in HF morphogenesis and cycle. In this work, the mentioned molecules were investigated to evaluate their role in follicular cycle activation. The study was performed on skin samples collected at different periods of HF cycle and the molecular expression of PDGFA, BMP2 and LHX2 was evaluated by Real-Time PCR (qPCR) at each time point. Since PDGFA showed the most variation, the goat PDGFA gene was sequenced and the protein localization was investigated by immunohistochemistry together with PDGF receptor  $\alpha$  (PDGFR $\alpha$ ). PDGFA immunostaining was observed in the basal layer of the HF outer root sheath and the immunoreaction appeared stronger in the regressive HFs compared to those in the anagen phase according to qPCR analysis. PDGFR $\alpha$  was observed in the HF epithelium, proving the effect of PDGFA on the follicular structure. The data obtained suggest that PDGFA and BMP2 are both implicated in HF cycle in goat. In particular, PDGFA secreted by the HF is involved in the anagen activation.

# SUSTAINABLE CASHMERE



Please contact CHIANTI CASHMERE GOAT FARM  
[www.chianticashmere.com](http://www.chianticashmere.com) for further information

