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Camelids Chronicle

NEWS-SHEET OF BRITISH CAMELIDS LTD., OWNERS AND BREEDERS ASSOCIATION

Letter from the Chairman of the Steering Committee

"To sell or not to sell abroad, that is the question".

Ann and I have always said we would not sell any of our animals until we have twelve breeding females; so that will not be for possibly five years. But on the other hand, if I had just seen my bank manager about my overdraft, and the next day an American offered me a lot of money for a llama, what would I do?

You could argue that Arab money has certainly not destroyed our race horses, but on the other hand we have a very limited number of animals and we must protect our meagre breeding stock. That's the reason for the register that we are compiling, so we can try and stop in-breeding etc.

These are the questions that you - the members - must decide. Your steering committee has done their work - your association is official; you have a basic set of rules, you have a chronicle and your association is now recognised as the mouthpiece of our lovely animals. So now come to the A.G.M. in December and form your committee to carry on the work we have been doing.

P.S. Sorry about the terrible miss-quote at the beginning!

Peter Thurston Brown

Association News

Report of the Association Visit to The Saffran Llamas - March 27th

It was a typical early spring morning and Surrey was looking about to burst with riotous colour, a brisk wind pushed the rain clouds along before they had time to take effect and eventually swept clean a patch of warm sunshine.

Henry and Ordell Saffran greeted a large group of members, spouses and guests with a welcome cup of coffee. We milled around chatting on our favourite subjects, and openly or secretly admired the attractive lama fibre garments being worn by the more talented of the members present.

Llamas and horses live happily together at Forest House; the big open-fronted barn houses both in large post and rail fenced enclosures. It was lovely to see so many elegant llamas at a glance.

Ordell talked about the two basic types of llama which she has in her possession, both pure bred but quite distinct from each other. One tall and square, with a large coat of hair; the other less tall with a longer body and marginally less fibre.

She brought out her pride and joy Winston the stud male, and ran through the conformation points he possesses which she favours. It is her intention to concentrate on breeding animals of similar type. We saw some of his offspring, which adequately demonstrated how effectively the he imprints his likeness.

We were shown the one and only guanaco and two of her llama-cross offspring, the crossbred males were castrated at 7 months.

Out in the fields were three young llamas one of which, Ordell pointed out, had a coat of fibre which would not embarrass an alpaca, another feature that will be encouraged in her breeding programme.

All animals at The Forest House are well handled and halter-broken, though Ordell was at pains to point out that young males are always left until fully 2 years old before receiving anything more than essential handling. This is to avoid the risk of producing an animal of abnormal temperament. She has proved to her own satisfaction that mature llamas can be made into loveable pets, whilst retaining their self-respect and respect for humans.

We were shown the llama crush which had been imported from the USA, it holds the llama secure and prevents it laying down, proving most useful when treatment is needed.

We then all adjourned to the Slug and Lettuce, where we squeezed 32 people into a dining room which would have been comfortably full with many less!

No one could be isolated when conversation between tables was so easy and all remaining barriers were lowered over the delicious lunch. By the time the tables had been cleared, we all knew each other well and were ready to participate fully in the debates thrown up by the meeting.

Finally, the door prizes were drawn; Ann Knowles-Brown and Derek Williams won and were delighted with the llama pins which had been presented by 'Llamas and More, Oregon, U.S.A.'

All agreed that it was a happy, interesting and useful day and we are most grateful to Henry and Ordell Saffran for making it so.

The Logo

Enclosed with this issue is a page displaying suggestions for the Association logo, sent in by members.

You are invited to vote for the ones you consider to be most suitable, in preferred order.

Fibre Co-operative

In the March edition of this newsletter I asked people interested in a fibre co-operative to contact me. Do I read the response correctly - is there really no one interested in a fibre co-operative?

Conversations in the recent past had led me to believe otherwise - that there were people who thought a co-operative was at least worth looking into in an effort to establish lama as fibre producing animals in the UK.

I have been in further contact with the National Co-operative Development Agency, a purely advisory body who are willing to attend a meeting of any group of people who want to know more about the subject and to deliver their presentation free of charge.

If there are people interested please drop me a line - Mrs. A. P. Bentley, Syke House, Newby, Penrith, Cumbria. CA10 3ED; or telephone 093 14 373, and I will pursue the matter further according to their wishes.

For Lamas Sake

Disturbingly often we hear from owners whose pet llama or guanaco has become considerably less adorable than the gentle, leggy youngster they had bought.

If they seek advice early they report spitting and barging; if they leave it much longer they are often desperate.

As breeders we are doing nobody any favours when we sell animals without making sure that the new owner is fully informed about how to look after them properly, the animal will always be the looser.

More particularly; will breeders selling a young male to somebody who obviously only wants a pet, please advise them of the following

1. The chance of spoiling him for life if he is fussed over and overindulged.
2. That he should be kept with other animals - never alone - preferably with male animals.
3. That, except for essential treatment, he should be left until he is two years old.
4. That at two years old he can be brought in and carefully trained to behave as they wish him to behave, without fear of spoiling him.

If pet owners cannot do this then the animal should be gelded before being handed over. A gelded male is more at peace with himself than an entire male who never has proper outlet for his sexuality. Such a male may well turn his frustration into aggression, and once this has happened he will be condemned to a life of isolation and torment - a cruel fate for an instinctively gentle and social animal.

It is surely our duty to do all we can to protect our animals by ensuring that new owners know as much as possible about the nature and needs of the animals they are buying before they take delivery of them.

Attraction and affection are not enough.

Insurance

Investigations have been made in an effort to improve the 7% offer for insurance of camelids. Two tentative proposals have been obtained.

(a) 2% of net value for calamity cover
Owner must own minimum of 15 animals
Excess of 2 animals per annum.

(b) 5.4% of net value
Cover for mysterious death (not old age)
Theft
Injury resulting in loss of use or death
No excess

These premimums may come down if a number of people in the Association take up the offer. Please send your comments to the Secretary, Pat Bentley.

Carneddi Llamas

I first became interested in llamas in 1972. It was not as a commercial venture that they attracted me but simply because they seemed to be unique and fascinating animals. I had a small hill farm in North Wales where it was possible to indulge my love of animals - though I was short of both time and cash and could not afford to make expensive mistakes. At the time there seemed to be a complete lack of text books on llama management. The best I could find then was four or five pages in Oliver Goldsmith's *'Animated Nature'* published in 1784. I read that the llama 'appears to be formed for that indolent race of masters which it is obliged to serve; it requires no care, nor expence in the attending or providing for its sustenance'. This sounded fine but thirty years of livestock breeding made me doubt its validity. I wrote to the Director-Secretary of the Chester Zoological Gardens to ask if there was any reason why a llama should not be kept on a small hill farm in North Wales. The reply was encouraging. Since it was a domestic animal, a llama could be kept on a farm in the same way as could a pet pony or pet cow.

So, with very little knowledge behind us, I bought our first llama in 1974, a young female from a small private zoo. She turned out to be even more interesting and fun than I had hoped. Llama care, we found, was outside our vets' experience but they kindly borrowed books from the library of the Royal College of Veterinary Surgeons for me to read with the details of the management of llamas in zoos. Even more interesting were photo copies of some scientific papers on llama breeding. It was a tremendous revelation to me then to learn that these animals did not have a recognised oestrus like our usual farm animals but that ovulation was stimulated by mating. I published this fact in 1978 in a book I wrote about our first llama and was thanked by a breeder in the USA who, like I, had not known this.

We called the llama 'Nusta' the Quechua word for 'princess'. When she was three years old, we took her to a male at Chester Zoo, not knowing the whereabouts of any other stud. Eleven months later we were thrilled by the arrival of a beautiful female baby. Two more visits to the zoo in subsequent years produced two baby males. Then we bought an old male from Chester. Nobody seemed to know his age but he had been a stud at Whipsnade for several years before coming to Chester. He was beautiful in appearance and very cheap so we felt that we couldn't go wrong.

In the meantime I was worried about Nusta. There were signs of blood in her urine and I called the vet. We lived in a district where tick-borne red water was common and I wondered if she could be suffering from this, although the symptoms did not seem to be the same as those in cattle. The vet diagnosed cystitis and prescribed accordingly. After a while, when Nusta was no better, the vet came again but did not have any new thoughts on the cause of her trouble. It was not, he believed, connected with the kidneys because the trace of blood was not dark. We went on with the cystitis treatment. Nusta continued to eat and did not appear to be really ill but she was thin and I felt desperately worried. I **knew** something must be very wrong.

Then quite suddenly she stopped eating. She became listless and I felt now that she was really ill. We must take urgent steps to find the cause of her trouble. Without any more delay, we took her to the Veterinary Field Station on the Wirral fifty miles away. There she had a laparotomy and it was discovered that one kidney was grossly swollen and infected. The vets who performed the operation also commented that the bladder seemed extremely small. Whether this was normal or not they did not know. They had never operated on a llama before. Nusta responded to treatment with antibiotics but the prognosis was not good. It was unlikely that she could breed again. She also had some liver damage from parasites though these were no longer present.

After three weeks we brought her home again. She seemed reasonably well for about three months and then began to decline again rapidly. Our vet thought that the second kidney was now infected. She did not respond to treatment. Rather than let her suffer, we had her put down. We gave her skeleton to the Department of Biology at Bangor University. It was glad to have a specimen of *lama glama.*

It was a sad end to my first beautiful llama but she had left us with a daughter and two sons and some hard-gained experience. I think now that ignorance and inexperience on our part and that of the vets can be blamed for this death. I feel it ought not to have happened.

Now there is a growing body of knowledge about llama care, particularly in North America where, all of a sudden, llamas have become a multi-million dollar business. Already the state of the industry has progressed far from the days when there seemed to be almost no practical information in Britain about llamas and when I had to refer to a book which had been published 200 years earlier. It was quite exciting to be among the first private llama owners in this country and I'm glad that we began with one much-loved individual. In those days we lived in a cottage in the middle of a field with no fence or garden round it. Nusta was able to walk through the front door and sit on the hearth rug like one of the dogs. It was a wonderful opportunity to study her in detail and to get to know the complex body-language of a llama. We developed a very close relationship.

Now we have six llamas, four of them decended from Nusha. one is a purchased female and one an unrelated stud. We shear them every second year at the same time that we shear the sheep. We have been a little unlucky in having a run of baby males but perhaps the run of females is yet to come. Two of the llamas are trained as pack carriers and, as in the USA, I think there may be a future for them in the recreation business. They also look good on TV!

The llamas are only a side-line on our small farm but they certainly give us a great deal of pleasure.

Ruth Janette Ruck
(Member of the British Camelids Association)

Lama Language

Modes of Communication in the South American Camelids

You are out feeding your animals. An adult female greets you at the gate with a series of gutteral clicking sounds. Two animals turn towards each other and there is successive interaction of changing ear positions. One of them curls its tail all the way forward and walks away. A young female suddenly begins hopping across the pasture in bounding leaps. Your male breaks away from the group trotting across the paddock with his snaking neck near the ground. He abruptly stops, smells a dung pile and points his nose to the air!

Wow! **What** is going on here?

Each of those postures, movements, gaits and vocalizations are a part of the lively world of "Lama language", a communication of some message to you or to fellow animals in the herd. **Lama** is not a misspelling of llama, but the generic name for at least three and perhaps all four species of South American camelid: the llama, alpaca, guanaco and vicuna (the latter is often separated into a genus of its own, called Vicugna). Because there are so many similarities among the four, and because so much of what we know comes from field studies of wild populations in South America, I'll be using the word "Lama" to represent all of them.

When we talk about communication between animals, we are referring to the passage of information from one individual (the sender) to another (the receiver). It depends upon signals that invariably modify the behaviour of the receiver. How did communication signals ever get their start? Many are modifications and stereotyped ritualizations of previously existing behaviours (food gathering, body postures and movements, and so forth), but they all permanently evolved into the species' behavioural repertoire only because there were definate advantages for the sender in altering the behaviour of the receiver.

An amazing feature of communiation signals that I'm sure you have noticed in your own animals, is the subtle nature of these signals. The slight or trivial change in the eat position of one animal can immediately cause its neighbour to jump back or abruptly turn away.

An in-depth analysis of communication signals commonly involves four components: 1) the nature structure, and description of signals. 2). the relationship between the

signal and internal state ("feelings") of the sender. 3). the effect of the signal upon the recipient, and 4). the function and survival value of the signal. In the following brief and generalisation article I would like to take a look at the nature and function of some of the common modes of communication in the South American camelids.

A word about determining the meaning or function of any one given signal: it is not an easy task, and some signals may have more than one meaning, depending upon the social context. For our purposes, however, it will be useful to try and regard the signal as the message. Lama language signals are usually not single entities: instead it is common for several to be given at the same time. For example, changes in ear, tail and neck postures are often made concurrently during aggressive disputes. Perhaps such multiple signals clarify and enhance the communicative value of the message conveyed. Let's take a look at some of the ways Lamas communicate.

Common Modes of Lama Communication

The principle channels of communication for all mammals are chemical, visual, auditory, and tactile. For discussion purposes here, I would like to divide the common means of Lama communication into 1). **body language** involving displays, postures, and positions of the body, neck, tail and ears. 2). **vocalisation** within and between groups. 3). **scent communication** and the importance of dung piles and external glands, and 4). **gaits** used daily and those that are less common.

Body Language

Visual displays are important for the South American camelids: their open habitat and often flat terrain allows communicative movements and postures to be seen over long distances. Body and neck postures are important for communication between adult males during advertisement and defence of their territories, while ear and tail positions are especially important for conflict between members within the group.

Broadside displays (the male stands at a ninety degree angle to his opponent), **S-neck displays** (when near his territorial border a male stands up with his legs straight and neck slightly curved), and the **horizontal** to **below horizontal neck** postures (used when an adult male is approaching or pursuing an opponent), are all important and common forms of aggressive communication between defending territorial males. If you have ever had two adult breeding males in adjacent pens, where the fence line becomes their mutual territorial boundary, you have probably seen some of these signals. They are used mostly for intimidation, dominance, advertising their presence and for status.

Lamas use their ears for sending signals all the time, primarily for aggression. Lama ear positions are **forward, above horizontal, horizontal, below horizontal,** and **flat.** Those below normal are communicating aggression (see illustration). In fact, these latter ear positions have been the basis of categorising different types and levels of aggressive interactions between two individuals (Franklin, 1978 and in press): **AHET = above horizontal ear threat, HET = horizontal ear threat, BHET = below horizontal ear threat** and **FET = flat ear threat.** Of course, ear threats are not done alone, but in conjunction with changes in tail and neck postures. It appears from work done to date that the lower the ears, the higher the level of aggression. The BHET is commonly done when the head and nose are slightly tilted up, but the FET occurs when the nose is pointed upward at about a rough 45 degree angle with the ears laid flat against the neck. You surely know from personal experience - perhaps even from point-blank range -that it is the BHET or FET that just precedes and accompanies that infamous Lama spitting display. If the contestants are evenly matched in an intensely aggressive encounter with both animals doing FET, the two will often face each other with necks outstretched, heads and noses pointed up, and ears flat in a **motionless stance** encounter. Of all these threats, the BHET is the most common in Lamas.

Tail postures are especially important to Lamas. The two non-domestic camelids, the wild guanaco (believed to be the progenitor of our domesticated llama), and the vicuna have dark brown tails placed on lighter-coloured background out contrast and easier visibility. Observe your llamas some time during their routine daily activities, and you'll be surprised at how "expressive" they are with their large fluffy tails. Though different tail postures form a continuum from flat against the behind to curled forward on the back. Lama tail positions can be usefully categorised onto the following (see illustration): **normal, below horizontal, horizontal, above horizontal, vertical** and **forward curl.** The higher the tail, the higher the level of aggression. When the tail approaches a vertical position, it occupies a gray zone between aggressiveness and submissiveness. So watch closely: depending upon the social context and the sex and age of the individual, it can be signaling either condition.

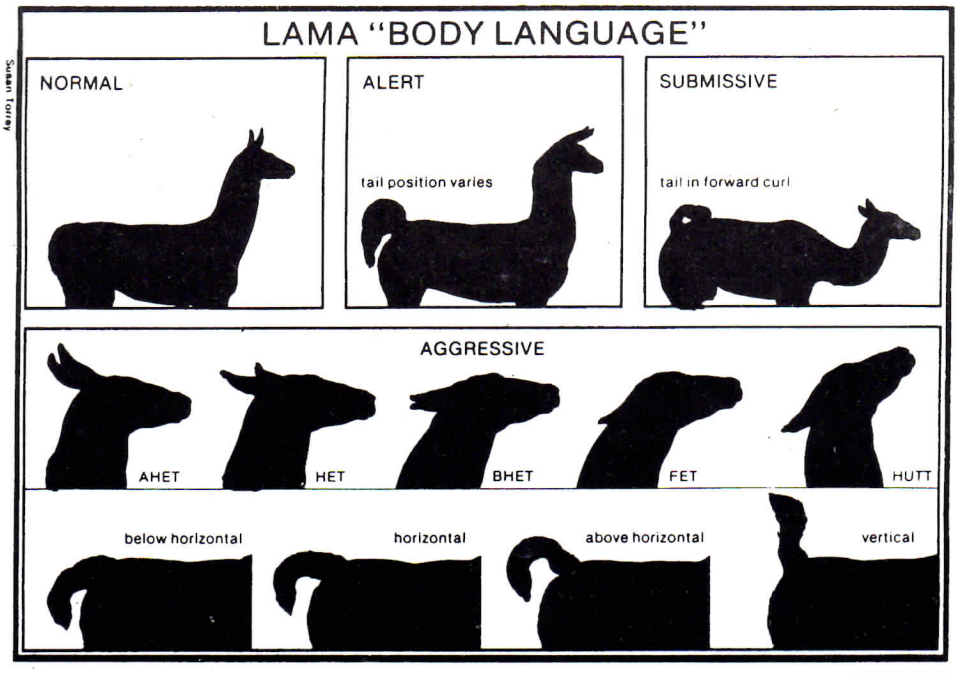
The tail in a full forward curl clearly communicates subordinance. It is a key part of the **submissive crouch** shown by juvenile Lamas to older animals or even to people. Normally in wild population, the submissive crouch is shown by young animals to the group's adult male by lowering the neck and head toward the ground, occasionally bending the front legs slightly, (ears are normal to above horizontal), and positioning the tail in forward curl. Captive llamas share this same "appeasement" posture, aimed at subduing the male's aggression. Its probable effect is a delay of the juvenile's forceful eviction from the family group by the male: such a youngster is "buying time", being able to stay longer within the socially stable family group and predictable food source of the group's feeding territory.

Now for a surprise. Adult "macho" males also will signal with a semi to full forward-tail curl when communicating "no aggression, I'm not going to attack, come in, you will be accepted" to new females (young or adult) seeking admission into the male's territory and family group. Look for it the next time you bring a new female on the place and your male interacts with her for the first time.

If you have an animal going into submissive crouches to you, it is showing subordinance and somewhere along the line became partially or profoundly socially imprinted on you (or on people in general), most commonly due to social attachment during bottle-feeding. Should you be flattered? Well, you be the judge: it considers you one of him, or him one of you!

Lamas as we know are fun and lovable animals, but social aggression - among themselves - is a very important part of the ecology. In wild populations of guanacos and vicunas, males rigorously defend territories occupied by their family groups. Within the family group there is a social ranking or hierarchy of individuals: inter and intra-group aggression is an integral part of the Lama life style. Without going into a lot of detail, it might be instructive to list the forms of body language used to communicate aggression, increasing in intensity from the subtle ear threat to outright fighting:

AHET	above horizontal ear threat
BHET	below horizontal ear threat
FET	flat ear threat
HUTT	head uptilt threat
Motionless stance	standoff or faceoff
Spitting	clear to green!



Rushing	short charge
Chest-Ramming	intentional collision, usually broadside
Chasing	pursuit
Kicking	forefoot strike
Biting	especially between males
Fighting	neck-wrestling, pinning, etc.

All of these are self-explanatory or have already been mentioned, with the exception of the head **uptilt threat** (HUTT); here the nose and head are pointed upward, nearly vertically, when two animals are contesting. The HUTT and motionless stance sometimes accompany each other. Why is there so much agression among Lamas? First of all, they are highly social, living in a group environment their entire lives. Territorial aggression is important for establishing and maintaining the exclusive occupancy and use of the feeding territory. A predictable and, in many cases, year-round supply of forage in the arid habitats of lamas is important to reproduction and survival. Aggression with the group results in the social ranking of its members, and actually facilitates a more peaceful environment once each member's rank or 'place' is determined. Dominant individuals have priority access to mates, food, water, bedding sites, etc., which is especially critical at times when there might be a shortage of such resources.

Vocalizations

Calls and subtle sounds are surprisingly common within the Lama group. They are important for communication between group members, both for those with close social bonds (mother-infant, fraternal peers) and for aggressive social interactions. Some calls are made during territorial fighting and one important vocalization occurs when potential danger is sighted. The most common Lama sounds include the following:

Humming	Normal, interrogative, separation, etc.
Snorting	aggressive - low to mild intensity
Grumbling threat	aggressive - low to mild intensity
Clicking	aggressive - low to mild intensity
Screaming	distress, fear
Ogling	breeding and other sexual behaviour
Screeching	territorial defence and fighting
Alarm Calling	danger warning

It's important in the husbandry and care of captive Lamas that we carefully watch for both the overt and subtle forms of aggression between members of your herd. Food and water are rarely in short supply, but low-ranking individuals are commonly denied access to the feed trough when high-ranking, dominant individuals are feeding. If subordinate individuals are excluded often enough from a single or focal source of food and are under the 'social stress' of being at the bottom of the social hierarchy, loss of weight and perhaps other health complications can result. Separation of low-ranking individuals from dominant animals is sometimes necessary. If you are feeding your animals hay in a corral or paddock situation, be sure to provide more than one feeding trough; this is even more critical if grain is part of your feeding regime.

Humming, sometimes called bleating, is low in tone and hard to hear unless you are close to the animal. Though it can be difficult to differentiate between them, each of the humming vocalizations varies slightly and is used in different situations. The **normal hum** is a soft 'contact hum' for maintaining auditory contact between group members; it especially seems to help newborns and their mothers keep close to each other during their first few days. Adults make deep-sounding **status hums** in a variety of contexts, as if communicating states that range through contentedness, tension, discomfort, pain and relief. Slightly higher-pitched, the **interrogative hum** has an inflection at the end, and is used by babies supplicating for nursing from their mothers (or from you). In a louder form, with a mild-to-strong intonation of stress, the interrogative hum becomes the **separation hum** used by infants, mothers and group members upon separation or reunion; it might also be used for calling to other species such as deer and cattle as a type of inquiry or greeting. The separation hum becomes a more whistle-like **distress hum** when discomfiture increases, as when a young animal is frightened or becomes separated from its mother.

The **snort,** a sudden burst of air from loose lips, is a low to intermediate signal of aggression between animals. The **grumbling threat,** called a growl or gasp by some observers, is a common vocalization made by an animal while feeding, when another animal comes too close; it is a mild form of aggression, aimed at repulsing the intruder. A rapid burst of gutteral **clicking** noises made with the tongue are frequently sounded between two animals upon first meeting each other or before or during a pre-copulatory chase. It is a mild form of aggression, sometimes directed towards people. Snorting, grumbling, and clicking threats are all accompanied by ear threat displays ranging from HETs to HUTTs.

Screaming sounds are sometimes emitted when an animal is severely frightened during capture, handling, or shearing. The characteristic mating sound of the male Lama, aptly named **ogling** by Tillman (1981), was first described in the classic German work of Hilde Pilters (1954) as a 'rhythmic expiratory grunting'. For the Lama breeder, ogling is an especially important and convenient signal that a pre-copulatory chase or a breeding is in progress. This is a gift; we couldn't have been given a better help for accurate record keeping!

Screeching is the loud squealing sound made by males chasing one another during territorial defense. It's a signal to the breeder with captive animals or the observer of wild populations, that there is a heated territorial fight in progress between two males.

Called everything from whistling to neighing, the Lama **alarm call** is made by both males and females when a strange, unidentifiable animal or a potential preditor is sighted. In the wild, alarm calls are caused by people, horsemen, dogs, Andean foxes, mountain lions, and mountain cats. In captivity, dogs are the most common cause. Alarm calling has been shown to be primarily a warning to other group members of potential danger in the immediate area. The group may or may not flee depending upon how close the danger approaches. There is no qualitative difference in the alarm calls of males and females. If a captive Lama (at least the llama and guanaco) is cornered and becomes excessively frightened during capture and handling, he or she will emit an alarm call as a signal of extreme fear.

Scent Communication

Scent is an all-important form of communication for Lamas as for most mammals. It has the advantage of communicating into the future, and in the dark. All of the south American lamas use dung piles for elimination, to greater or lesser degrees. Wild vicuna of both sexes use dung piles, even the young animals when they first start eliminating. Wild female guanacos, on the other hand, rarely make use of dung piles within the group's feeding territory. Dung pile used by wild female s appears to be more important. Yet in captivity, both guanaco and llama males, females, and young make use of dung piles nearly all the time. Field studies done to date with vicunas suggest that dung piles are especially important for intra-group orientation, i.e. for helping keep group members within their territory. Rates of defacation and urination increase when animals are out of their familiar territory, and under socially stressful situations. Dung pile use by female guanacos may be less important because of greater group fluidity and lower site-attachment compared to the vicuna.

A special social use of dung piles is made by adult males during defence of their territories. Territorial males frequently stop during an encounter to do a **defecation-urination-display** (DUD) on a dung pile as a ritualized part of the defence process. Stopping, smelling, turning, positioning and occasionally eliminating are the principal components of the DUD. Dung piles are randomly scattered throughout the territory, and not towards the boundaries, while DUDs by the male tend to be near the periphery of the territory. An interesting consequence of dung-piling behaviour by the South American camelids is an acceleration of soil and plant succession around those sites. This increased greenery and production is closely grazed down by the vicuna, but left standing by the guanacos and llamas.

Flehmen ('flay-mun') is another behaviour often occurring in the vicinity of the dung pile, though it is not necessarily a communication signal. This vertical raising of the head and nose into the air is a mechanical manoeuvre for intake and decoding of the sent message in the vomero-nasal (Jacobsen's) organ in the top of the animal's mouth. Common throughout mammals in one form or another, it is especially seen in males during the mating season. Female or juvenile llamas will occasionally display flehmen after sniffing the ground, but for the male it is an integral part of detecting whether a female is in estrus after having smelled her urine. Flehmen is also referred to as 'lip-curl', though in Lamas the mouth may open but the lips usually are not curled.

Speaking of smelling, the scent glands of the South American Lamas have yet to be fully described, but an obvious gland that you have noticed is located on the lower rear legs of your animal, one on the inside and one on the outside of each connon bone. Often incorrectly referred to as a 'chesnut' since it roughly resembles the callous growth found on horses, this is in fact a metatarsel gland. Animals can occasionally be seen rubbing the gland on the opposite rear leg. Its function is under study, but in the deer family this same gland produces an alarm pheromone (scent) when animals are frightened. Another easy-to-locate scent gland can be found between the toes on each front

and rear foot. We have much to discover and learn about Lama scent communication.

Lama Gaits

A brief word about Lama gaits as related to communication. The entire camel family employ as their fast ambling gait the pace, in which the feet on the same side are placed on the ground simultaneously. This is a well-suited adaptation for the long-limbed camels and Lamas, a gait that improves the speed of such open-habitat species even though it sacrifices agility. The Lama walk, too, is nearly a true pace.

The gait that has social communicative value to Lamas is **stotting,** a series of bounding leaps in which all four feet touch and leave the ground more or less simultaneously. It is used during play by the young, but is an important 'coquettish' display by young females during courtship. I have seen it most often in wild populations of guanaco in South America, when young females seeking acceptance into a male's group finally retreat half-heartedly from the pursuing male, coyly useing this bounding gait.

This has obviously been a brief and superficial review of a fascinating and complex subject. We've a lot yet to learn about Lama language and the horizon is ours. Armed with these first approximations of the meanings of Lama communication, we not only add to our enjoyment and appreciation of these delightful animals, but gain valuable help in our raising and caring for them. Let us now begin to see and listen to the magic world of LAMA LANGUAGE'.

William L. Franklin

William Franklin is a mammalian wildlife ecologist who teaches and conducts research at *Iowa State University.* His special interest in guanaco and vicuna behaviour and ecology has taken him frequently to South America.

The Knowledge Pool

by Peter W. Scott, MSc, BVSc, MRCVS, MIBiol.

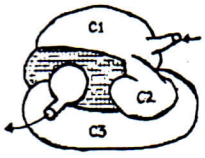
Basics of camelid digestion

In trying to put together a short article about the wonders of the camelid stomach one is faced with conflicting views on even the most basic facts, i.e. how many stomachs are there. The answer depends on what you are counting as you might expect, but we will come onto that later.

Despite rumours to the contrary camelids are not ruminants, they evolved completely separately but solved similar problems in a similar way. They have evolved a simpler system which is perhaps more suited to browse and high fibre grasses, rather than the ruminants which have evolved to deal primarily with high cellulose grasses. They are described as both grazers and browsers. Other species such as the horse have voluminous hindguts where cellulose digestion occurs.

Plant cell walls containing the polysaccharides hemicellulose and cellulose are the major dietary component for herbivores, large differences exist between various animals in their ability to digest them. A number of grazers and mixed feeders can manage over 80% digestion, most can manage over 50% and the group described as concentrate selectors which includes the giraffe, digest them quite poorly.

Although the details of camelid digestion are not well worked out, forestomach function seems similar to cattle, but it is probably less important overall.



C1 83% of total volume
C2 6% of total volume
C3 11% of total volume

The camelid stomach has three main chambers, or two functional sections. Firstly, a large rumen- like chamber which is subdivided into a cranial sac and a caudal sac, which are linked functionally with a second chamber. The first chamber occupies the whole of the animals left abdomen. There is a cycle of contractions (less regular and defined than in ruminants) which churns food around between the first and second chambers about 5-8 times a minute, followed by a pause of about a minute before the whole thing begins again. Well mixed food is allowed to enter C3 where most serious digestion occurs. The cycle slows down considerably between meals.

The camelid is remarkably efficient, research indicates 25-50% more efficient than sheep. Part of this no doubt relates to their ability to recycle urea when on poor diets, enabling them to make the best of what nitrogen is available, natural pasture is about 5-6% protein but this can seriously limit the animals fibre development. As a consequence of their efficient digestion and metabolism camelids run a high blood glucose level than do ruminants. In this respect they appear to have something of a compromise between the monogastric (single stomached) and ruminant type digestion.

Good grasses and lucerne are wasted, and in fact can lead to tympany (bloat), care should be taken in turning animals out in spring onto rich pastures. Flatulent colic or diarrhoea can result from excessive amounts of rich green food.

Grazing on mixed grass and clover pastures is ideal, generally however grazing on restricted paddocks means that supplementary dry forage is needed as well. The aim should be to provide a protein intake of about 10-12%. Salt block with trace mineral additives or loose salt mixed with bone meal and molasses are worthwhile additions to the diet. Selenium may be necessary in some areas.

Grazing is often based on a livestock equivalent (LE) system, for example a reasonable pasture might support 1.6 LE/acre, a dairy cow would be 1LE, a beef animal 0.8LE, a ewe with lamb at foot 0.2 and other sheep 0.1. South American experience on open pastures suggests that alpacas might have a value of 0.3 on this system, and a llama 0.4. Obviously if supplementary food is used and good grassland management practiced the number of animals per acre will be greater than this. Bear in mind that new animals should he held off pasture till faecal checks can be done for parasites and appropriate wormers given, there is no situation that suits parasites better than keeping animals on the same piece of restricted pasture indefinately.

Browse (leaves and twigs of trees and shrubs) generally contains higher levels of crude protein and phosphorus during the growing season than do grasses. This is balanced by a number of factors within browse which can reduce the availability of nutrients. Lush spring growth of grasses is high in protein, moisture, vitamins and minerals, as the grasses mature the proportion of fibre increases.

Hay is used as a high fibre food material at approximately 1kg/50kg body weight (about 2%), few animals can eat more than this level although some will try and may cause themselves impactions.

Hays are around 7-11% protien (timothy the lowest and meadow the highest) although in terms of digestibility these all work out around 4-7%, fibre is 30-35%, the carbohydrate level is around 17.20% and the moisture 15-20%. Lucerne (alf alfa) is a legume crop hay which is useful because it can have a relatively high protein level 14%. Carotenes are oxidised to quite low levels during hay making, but vitamin D levels are enhanced by the sunlight.

Any good quality seed or meadow grass hay is fine ad lib, although if using lucerne hay amounts eaten must be watched as gorging is reported to have lead to impactions

of the forestomachs (often indicated by 'vomiting'). The legume hays contain higher levels of protein and carbohydrate than do grass hays.

Dried grass has high protein ×13%, low moisture× 10%, carotene levels remain high because the drying is quick with no time for oxidation, but the vitamin D content is low.

Most cereal grains are fairly similar in analysis, Protein 10%, Fibre 2-10%, Carbohydrate 60-70%, Oil 1.5-5% and water to make up the difference. Grains are generally low in minerals, high in phosphate (as phytate) which interferes with calcium absorption, and are low in vitamin D.

The question of whether grain should be rolled, craked or whole is vexed. Rolled cereals can be unpalatable and can lead to impactions or sudden pH changes and acidosis, in the US some suggest that cracked grain may be too abrasive on delicate animals. Whole cereals can be poorly digested. On balance for the small amounts of cereals used I would suggest cracked is best since camelids don't chew that well (unlike sheep but like cattle), and the pH fluctuations associated with rolled cereals may predispose to stomach ulceration.

Camelids rarely bloat, they don't seem to have displaced stomachs, nor do they often pick up foreign bodies except where their diet or husbandry is very abnormal.

Trace elements are a very important consideration with any livestock, including camelids. In more conventional farm livestock it is suggested that deficiencies of copper, iron, iodine and selenium are genetically linked. The most important trace element deficiency in cattle is copper and in sheep is probably cobalt. Camelids appear to be more cattle like in this respect, although in the American situation there is great concern over selenium in camelids. It can be very difficult assessing the importance of trace element deficiencies since often the active form is not the form which can be measured on blood tests, this particularly applies to copper, cobalt and selenium, with the latter it need to be interpreted along with vitamin E levels.

Various methods of selenium supplementation have been used for ruminants, subcutaneous injection, water medication, intraruminal pellets or in-feed. Some very high levels of selenium are included in some US in-feed supplements.

Mating procedure, alpacas and llamas

Male and females together for one week, then take male out, after 2 weeks test for oestrus by seeing if she accepts male, then follows a danger period during which she may abort or resorb, test again at 45 days.

Female puberty at 10 months, show sexual behaviour at 12-14 months breed first ideally at 15-18 months. Puberty is related more to size than age, they become mature at 60% of adult weight.

Spontaneous ovulators

Year round breeders

Gestation period 343 - 346 days - alpaca
348 ± 9 days - llama

Mating 2-3 days after parturition but sterile, takes – 10 days for CL to shrink, then will be fertile

Rebreed best at 15-20 days

50% of eggs lost in first 30 days (alpaca)

— usually get rid of placenta in 1-4 hours - if not give oxytocin at 4-6 hour intervals
— caesarian better than embryotomy

Camelids (average weights)

	Male (kg)	Female (kg)
Bactrian - *Camelus bactrianus*	500-690	450-550
Dromedary - *Camelus dromedarius*	500-750	400-550
Llama - *Lama glama*	162-243	108-189
Guanaco - *Lama guanicöe*	100	90
Alpaca - *Lama pacos*	60-80	55
Vicugna - *Vicugna vicugna*	40-65	30-40

all have 37 pairs of chromosomes

"In discussing the value of post mortem examinations and blood tests with various members of British Camelids it appears that there may be quite a bit of useful information circulating around but which is too spread out to be of value.

It is vitally important that whenever possible animals are submitted for post mortem examination, preferably by MAFF Veterinary Investigations Centres, your local vet will let you have the address of the closest. This will hopefully reveal the reason for an individual death but may also point towards factors which put others in your own group at risk. More than this it may give data which when combined with other similar reports could show up a national problem. We already have considerable data from these species in zoos and some private collections in a number of countries, but individual data from animals in this country is needed.

With animals such as llamas, alpaca and guanaco where only a few may be kept by one individual a pattern may be difficult to detect, however, if data can be pooled it could reveal useful information which could be fed back to members via this newsletter in an anonymous form.

Similarly blood sample data and related diagnoses would be of great value if correlated, providing a database which could be referred to by consulting vets when individual owners have problems.

Zoos already carry out this type of proceedure in their own collections and are at the moment putting in place computer systems to allow zoos to link their medical and laboratory data for correlation. British Camelids could lead the way in this by members sending post mortem reports and blood test results in confidence to Peter Scott, Keanter, Stoke Charity Road, Kings Worthy, Winchester, SO23 7LS, trusting that this data would be collated, and a general report and summary mentioning no names could be made available for publication perhaps 6 monthly or annually."

Editor - this information will give the association an idea which subjects could usefully be reported upon or specifically researched.

Letters to the Editor

Dear Madam,

Having been recently informed by an American colleague that an auction is to be held sometime this autumn in the United Kingdom involving the sale of some 40 - 50 U.K. llamas, I wish to record my extreme concern should this prove to be the case.

Firstly, there are too few llamas available in the U.K., as we have personally experienced during our 12 month quest to purchase 3 females for our foundation stock.

Secondly, the established American llama breeders have set their market prices far beyond the current U.K. scales which if applied to the U.K. market could retard growth for both owners and future U.K. owners.

With a total current ban on all camelid imporation from the U.S.A. imposed by M.A.F.F. we can at present only stand by helplessly and watch American breeders (or their agents) purchase all U.K. stocks for export to America.

As a suggestion, to avoid this one way traffic, should we not consider approaching the ministry to seek a ban on all camelid exporting for at least 5 years to enable U.K. foundation herds to attempt to get established, with possibly limited licences being granted for exchange of animals as a longer term alternative.

Michael Warner,
The Old Rectory, Thorpe Morieux,
Bury St. Edmunds, Suffolk.

Obituary

Tim Walker who passed away early in April after a brave battle against cancer will be remembered by many people in the field of preservation and conservation of wildlife in this country. He also had considerable business talents which he combined with being Chairman of the World Wildlife Fund in this country.

He will be remembered for his love of the wild animals he kept on his lovely estate in Wiltshire. He was especially interested in the breeding of Lamoids and had expressed great interest in the future of the Association. His valued knowledge of these lovely animals will be missed by us all. His wish would have been that we continue the work he started at his lovely home, Midway Manor in Wiltshire.

Derek Williams

Mr. Walker was a member of British Camelids.

Llama Driving (continued)

Before hitching the llama to the trap you will be sure, through your training so far, that none of the tack bothers him, that he understands your voice and rein commands and readily obeys them, and that, in particular, he will stand still when required to do so until he is told to move on again. This is important, not least because most traps are accessed in front of the wheels.

He must be completely confident to move away from home and friends and be amongst people, dogs and light traffic.

Now is the time to get him used to pulling. Add the tugs and traces to the harness and have your assistant follow him, pulling on the traces as you ground-drive the llama from behind them both.

Select a trap of suitable height and weight. Measure the llama and the shafts and make sure the shafts are the correct length. The front of the shafts should not protrude in front of the chest of the llama, as this will make it difficult for him to turn the trap. They must be long enough to ensure that even when going downhill the swindle tree is well away from the hocks.

Leave the trap in his box so that he has time to get used to it, move it occasionally whilst he is in the box until he is unconcerned by it.

It is also a good idea to have someone push the trap around whilst you ground-drive your llama, it will help if he becomes used to the rattle and movement of the trap behind him.

On the day selected to put him into the shafts, first put the trap into the training area and ground-drive the llama to it. Let him inspect it if necessary, and then stand him in front of the shafts and have the assistant hold his head.

Always put the trap to the llama, never the other way round. Raise the shafts to prevent inadvertently bumping them into his quarters, lower them just behind the tugs and slip them through - up to the stops on the shafts. If he is calm about this, do up the belly band, clip the traces onto the swingle tree and do up the trace tugs on the shafts.

Rock the trap gently back and forth to check that the length of the shafts is correct and to introduce him to the effect of the movement of the trap on his body. Lift the shafts a little to draw his attention to the upward pressure which occurs round the girth as the balance of the trap alters when in motion.

If he accepts all this with calmness, take up the reins and position yourself beside the trap with the assistant holding the lead-rein at his shoulder, and ask him to 'walk on'. The assistant will do nothing more than help him to carry out your instructions if he seems a little reluctant or confused. If all goes well she will need to do no more than walk beside him.

As with all lessons, give him time in familiar surroundings to get used to everything, introducing wide turns, circles and figures of eight.

Then, with the assistant still at the llama's shoulder, gently mount the trap and settle yourself comfortably into the seat. Continue the familiar exercises with the assistant gradually withdrawing her support, leaving you to enjoy driving a happy, confident llama.

This can be regarded as the end of the basic training. He will have build up strength and confidence, learnt the vocabulary of words and rein-aids - and to obey them. He will rely on you to tell him what to do and when to do it, and will willingly carry out instructions.

From now on you can gradually widen his field of work, taking him into new areas and situations, but keep alert. Be aware of your surroundings at all times, anticipating his reaction to up-coming situations and preparing for them. Keep an eye on his ears and head, so that you know how he is feeling. Constantly check the condition of the harness and the trap, and make sure both are safe and comfortable for him.

It will be useful, as soon as he is ready, to teach him to reverse the trap and to turn it to the right and the left, on its wheels; both these manoeuvres are very useful if you ever get into a muddle.

As at last you pad off down those leafy lanes, watch out for horses - they won't be able to believe their eyes.

P.G.I. USA

British Camelids Owners' & Breeders' Association

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REGISTRATION NUMBER – 2260892

The Association was formed in October 1987 and will remain under the guidance of the Steering Committee until December 1988 when a general election by members will appoint the Management Committee to stand for the next three years.

It is the only association formed in Britain to foster and guide the growing interest in Camelids.

Whether that interest is in the animals purely for pleasure, or for tourism – trekking, cottage industry – for exhibition, research or the agricultural production of fibre, the Association is there to be of service to its members and to benefit the animals.

The Association will work to promote good husbandry practices and sound breeding programmes for the improvement of stock and increase in numbers.

It will establish and keep herd books to encourage the pure breeding of each distinct species which form the camelid group of animals.

It will encourage the agricultural production of fibre, promote and undertake scientific research programmes and publish the results.

For further information, or to join the Association, please send an s.a.e. to The Secretary, Mrs. A. P. Bentley, Syke House, Newby, Penrith, Cumbria. CA10 3ED.

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The ancestors of the species Camelidae lived in the north of the North American continent.

At some time before the continental plates moved apart, some of the species migrated east and became the Old World Camelids, The Camelus dromedarius and the Camelus bactrianus, commonly known as the dromedary and bactrian camels, with humped backs. The dromedary is a wild animal and on the endangered species list.

Others migrated into the South American continent and became the New World (or South American) Camelids, flat backed camels of the species Lama (note one L). The Lama glama, Lama guanicoe, and Lama pacos; – commonly known as the llama guanaco and alpaca.

The guanaco is a wild animal and is on the list of animals whose numbers are causing concern.

The Vicugna vicugna is a separate species in the family camelidae, they are wild animals and on the list of endangered species.

The Llama, tallest of the South American camelids, is a gentle, inquisitive, intelligent, strong animal, used in South America primarily as a pack animal – also for their fibre and meat.

Alone amongst the Lama group of animals the llama has distinctive ears which curve towards each other at their tip.

The fleece can be any colour from black through browns and greys to white, and is often a combination of colours. It is bulky on the body, shorter on the forehead, tail and thighs – the lower legs are smooth.

They require only normal stock fencing, field shelter and a supply of clean water. Feed good hay and some concentrates when the grass is poor in winter.

Females mature at about 18 months old, males at about two years. Males should be removed from the parent herd at about one year old. Mature males cannot be kept together if there are females about – they will fight and seriously damage each other.

Gestation of about 11 months produces a single baby – twins have been recorded but are rare.

Worm regularly with a broad spectrum wormer.

Shearing is normally carried out every other year, but it is becoming more common to shear every year. Yields vary considerably but a good fibre animal will produce up to 3 kg. The fleece consists of a short, wavy undercoat and a coarse hair outer coat. Cleaning reduces fibre quantity to between 66% and 85% of the clipped weight.

It may be necessary to tranquilise some animals for shearing to minimise stress.

The Alpaca, smaller than the llama and guanaco, is a shy, gentle animal which produces a large, magnificent fleece of fine strong fibre. Colours range from black to white, through all shades in between, and are sometimes patches of any colour combined with white.

The hair grows long and thick on the forehead, down the neck, over the body, down the legs and on the tail. The leg and tail fibre is of a lesser quality.

They live out all year in grass paddocks with normal stock fencing, but barbed wire is not recommended. They appreciate field shelter and must have a supply of clean water. In winter feed ad lib hay, in boxes on the ground, to minimise contamination of the fleece by seeds and debris – and about 0.25 kg. of concentrates per head per day.

Worm with a broad spectrum wormer for the treatment of internal and external parasites. There is no need to dip alpacas.

Trim their toe nails when necessary.

Shear like sheep, an annual clip will produce a fleece of between 2.5 kg. and 5 kg. It contains very little grease or dirt and few, if any guard hairs.

The gestation period is 11 to 12 months and produces a single baby.

Put the female back to the male between days 10 and 15 after parturition for two good matings on consecutive days. Camelid females are induced ovulators.

Copulation takes place with the pair lying down and should last at least 20 minutes.

Mature males cannot be kept together in the vicinity of females, they will fight and can seriously damage each other. Males of over one year old should be removed from the vicinity of females and kept in age groups if possible – or in individual paddocks.

The Guanaco is smaller than the llama and bigger than the alpaca. A fine-boned animal whose elegance and delicate appearance belies its strength and resilience.

Like the vicugna, the guanaco is classified as wild and breeds true to type.

The fleece is tan colour on the back and at the back of the neck, shading to fawn. The smooth coated underbelly is white. The small head and straight alert ears are grey and smooth-coated; the legs, also smooth-coated, are grey, shading to tan and white. Hair on the neck of the guanaco is short at the head end and grows longer nearer the shoulders and chest.

Keep in grass paddocks with normal fencing (barbed wire is not a good idea) field shelter and a clean water supply.

Feed hay ad lib and about 1 kg. of concentrates per head per day in the winter when grass is poor. Stocking rate about 5 to 6 per acre. It is desirable however to keep fewer animals on about an acre – they love to run from time to time and should have room in which to do so.

Gestation period is about 11 months and produces one baby. Females mature at about two years, males at about three years. Remove year-old males from the herd. Mature males will fight if kept together in the vicinity of females.

Because of their tendency to run and jump when stressed, they require patient and sympathetic handling. For large numbers a deer handling system is ideal.

The fleece will weigh between 1.5 to 2.5 kg. and consist of an outer coat of guard hairs with a soft, downy undercoat which will be between 80% and 90% of the total fleece. Guanaco undercoat is second in quality only to vicugna fibre, which is the finest, most valuable fibre in the world. Tranquilising for clipping minimises stress.

Because the guanaco is classified as wild, owners are required by law to hold a Wild and Dangers Animal's Licence, obtainable locally from the Department of the Environment. This is for the protection of the animals – not humans! The timid guanaco is by no means dangerous.

Bactrian Camel

(Camelus bactrianus)

The two humped bactrian camel is found over a large area of Asia from mid Russia through Mongolia to China. They have been domesticated for centuries and the only wild herd still in existance is in the Trans-Altai Gobi desert numbering probably only a few thousand specimens. With their very hairy coat in the winter months they can stand extremely low temperatures though in some Asian deserts in the summer they also stand extremely high temperatures.

Temperament is very similar to the Arabian camel and they are generally treated the same in captivity in Britain. Young, newly born bactrian camels have to have multi vitamin injections for a while and the mother's diet supplemented while the calves are first suckling to ensure that the calves develop properly in their first few months. If this is not done there is a tendency for the two humps of the baby camel not to form properly. If this happens before about 12 months of age they may have one or both humps 'fall over'. Once this happens, even with the best subsequent feeding, they never seem to straighten up again and they may have humps that are not straight for the rest of their lives.

With their very heavy winter coats there is a considerable quantity of wool from a bactrian camel when they moult. This fleece is very good, soft and can be used for high quality garments.

Bactrian camels are normally dark brown in colour though white specimens occur. The white male we have in the Longleat herd sires some white and some brown calves from his brown females.

If anything bactrian camels are even more easy to keep in Britain than dromedaries due to their extremely hardy constitution. They should not be kept together with dromedaries as the two species will interbreed. The result of this is not three humps but one very large hump on an animal which has a very think coat and looks like a bactrian. A not very attractive animal.

Articles by Roger Cawley, Chipperfield Organisation

Arabian Camel

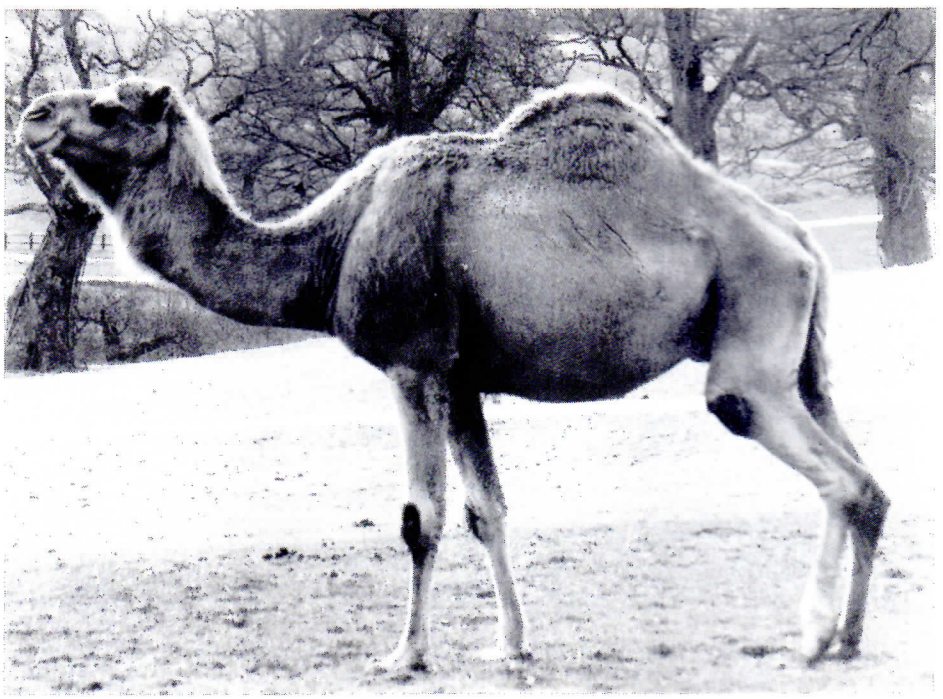
(Camelus domedarius)

The Arabian camel, sometimes known as the dromedary, is found all over North Africa as far south as Kenya, the middle east, into Turkey, southern Russia, Pakistan and India. It has been domesticated for centuries and now no wild camels exist except large numbers of feral camels running wild in Australia which were probably imported from India in the last century.

This species, which has one hump, is very easy to keep in any climate. In Britain camels can be kept out all the year round with just the provision of a lean-to shelter for their use during bad weather. Little veterinary care is generally required if they are regularly wormed. They will graze the roughest pasture and do well with the addition of hay and a small daily quantity of concentrates in the winter months.

Temperament of the Arabian camel is usually very even, especially with females and young stock. The bulls can be aggressive and have to be handled with care, though if one bull is kept in a herd of females he is usually less difficult than kept on his own. They occasionally will breed every year but generally will miss a year after calving. Gestation is about 12 months.

Young dromedaries having their first calf often have problems both with the birth and rearing the calf. It is often necessary to hand rear the first born calves but subsequently camels become good mothers and generally rear their calves easily. In captivity it is as well to help the calves' development with multi vitamin injections from time to time when they are up to perhaps three or four months old as they are prone to bone development problems in the feet.



This species will breed at about four years of age and generally live well into the late twenties or even thirties in captivity. The coat of the Arabian camel is rather fine and when they moult in the spring it is hardly noticable and little fleece is produced. Although normally fawn in colour very dark, even almost black, individuals occur and white camels are numerous. In parts of Morocco there are even a few skewbald camels.

They are easily trained to lead, carry loads, be ridden and to lie down if this is done when they are between about one and three years of age and after handling well in this way will stay very tractable all their lives.

Sir Titus Salt of Saltaire

The history of alpaca fabric, so important to England in the last century, is entirely due to a Bradford manufacturer called Titus Salt.

He was born a farmer's son in 1803. When his father gave up farming to become a wool stapler in Piccadilly, Bradford, in 1922, Titus also left the land and began training in the textile business, joining his father's firm two years later.

By the age of 31 he was in business on his own account as a worstedstuff manufacturer and by the time he was 40 had made himself a fortune.

His success was due to inovations he pioneered in the use of new and rare fibres in worsted manufacture – most particularly alpaca and mohair. In 1836 he found a few bales of filthy alpaca wool which had been long-forgotten in a dark corner of a Liverpool warehouse. As he handled the tangled fibres his fingers told him that here was a fibre of great potential, and he bought the lot for 8d. a lb.

He had seen that the grubby fibre, once scoured and combed, could be transformed into a luxury fabric of the highest quality, and this he did. Within three years the quantity of alpaca fibre being imported had risen to two million lbs. and the price to 2/6d. per lb. In the years that followed his factory produced millions of yards of the finest alpaca fabrics in the world.

Some was woven into lightweight cloth, the natural lustre of the fibre resulted in a fabric likened to silk. From this were made crinolines for the elegant ladies of the day. Some was woven into high-class worsted fabrics for gentlemen's suiting and coats, the lesser quality parts of the fleece were used to make hardwearing work clothes, peticoats and linings.

The quality, versatility and strength of alpaca was unrivalled and the production lines were highly profitable. Because Titus Salt was a paternalistic man of action with a social conscience, those profits were well used to benefit society.

By 1850 Titus Salt's reputation as a manufacturer of fine cloth was unrivalled in Europe and America. His workplace, Bradford, was acknowledged to be the textile capital of the world, but life for those living and working in that capital was uncomfortable, to say the least. None the less, people flooded in to work in the prospering factories. The population of Bradford grew from 16,012 in 1811 to 103,771 in 1851, and the town's commercial resources were overwhelmed.

It was a town of strangers; over half the population had been born in the countryside beyond the city and were strangers to each other, and to city life.

They crowded into the stinking rat-infested tenements clustered round the factories. With the complete absence of urban engineering the unpaved streets, the river and the canal were little more than channels for sewerage and refuse. Disease, depravity, debauchery and violence ran rife. Over everything hung perpetually a thick blanket of acrid smoke from the chimneys, shutting out the sun and light, clogging the lungs and irritating the eyes of the unfortunate inhabitants, making life intollerable.

Titus Salt always played an important part in the public life of the town of Bradford, pushing for the establishment of a municipal borough and towards free trade through the organisation of the Anti-Corn Law League; he campaigned all his life for improvements in the electoral system and the extension of the vote to working men.

When, in 1850, he decided to build a new factory to house the more efficient wool-combing machinery which had been developed, he decided to build it in the clean air of the countryside outside Bradford and to build around it a village to house and serve the community of workers. Between 1851 and 1872 he built the most famous of the Victorian 'model' villages, designed to deal with the fundamental social problems of the day.

He named the village Saltaire and ploughed into it the profits from his business and all the social amenities so dreadfully lacking in Bradford.

First he built the factory and ancillary buildings; then houses for managers, overlookers and workmen, with rents ranging from 7/6d. to 2/4d. He built bath and wash houses, schools, a public dining room to seat 700, where meals were available daily. He built places for worship and leisure, a hospital, institute and alms houses, the whole supplied by an efficient sewage system, piped water and paved streets.

When completed, Saltaire was a comprehensive economic and social unit which was visited and admired by dignitaries from all over Britain and overseas.

Titus Salt was made a baronet in 1869, the final accolade for a man who had devoted his life to public service and industry.

Shortly after his death the South American suppliers of raw alpaca fibre withdrew the product from the market and, to this day, only part-processed fibre is available to manufacturers.

In 1894 the Salt family sold the factory and village to a consortium of local business men; through a series of subsequent ownerships the village remained a company village until 1933, when the then owner sold the houses to the Bradford Property Trust Company.

In 1903 a statue was erected to celebrate the centenary of the birth of Titus Salt and the fiftieth anniversary of the opening of the factory at Saltair. At its base are the replicas of an alpaca and an angora goat, the fibres of which he had so successfully exploited and through which so many social and industrial improvements had been made.

Pat Bentley

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Contributions are welcome: Letters, Matters of general interest, Scientific reports, Personal reports, Questions, Problems and solutions, Subjects for debate, etc.

It will be helpful if articles can be submitted in double spaced type. Black and white photographs are welcome and can be returned if a S.A.E. is provided.

Contributions for the September edition should ARRIVE at:
Syke House, Newby, Penrith, Cumbria CA10 3ED by the END OF AUGUST.

Cumbrian Comment

Retired farmers hereabouts never lose interest in the job. When they can no longer farm themselves they take to 'farming over the hedges'.

Farming over the hedges is, unlike their life's work, an easy, no lose occupation: they count the docks, criticize the furrows, inspect the walls and judge the stock.

One such gentleman came past here the other day. He stopped and leaned on the gate – contemplated the view for a while and refilled his pipe. Finally he straightened and, slowly turning, was heard to mutter "Aye; them's queer sheep".

Pat Bentley, Syke House Alpacas

Forest Llama

Sunday afternoon in July – and the Forest full of tourists (or Grockles as they are known locally). Not the best time to take a – the young llama for a walk, but off we wentllama, the dog and I. Rolfi is a goofy, over-friendly German Shepherd and the current love of his life is Lucinda Pike-Llama – a very pretty young lady.

We walk for about an hour with frequent stops to roll in the sand and investigate the unusual – Lucinda's sense of right and wrong is very strong, and trees do not have junction boxes growing half way up their trunks!

After a long perusal from all directions we are at last on our way home through the woods. The peace is broken by the sound of two ladies approaching, talking like Hinge and Bracket! "Oh, Mary, there's a llama down here". "Don't be silly, Emily; there are no llamas in the New Forest your're imagining things again – OH-Oh –it is a llama".

We stopped for a chat and investigation (the ladies investigated by Lucinda), and carried on our way.

Lucinda looked smug, there are llamas in the New Forest.

Elkie Craige, Llama Lines 1983.

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