

# A Guide to **SELECTING AND APPRAISING ALPACAS**

By Cameron Holt  
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# SELECTING AND APPRAISING ALPACAS

## FIRSTLY REMEMBER YOU'RE BREEDING GOALS

**Appraising alpacas is a comparative assessment, bench marked against the "Ideal". It is a process based on "Breed Standards" and "Breeding Goals"**

As you inspect, it is important to have an overall view of the alpaca. As you do this you will get an impression (based on the ideal) Remember the first impression is usually the best (this can alter of course when you open the fleece). During this appraisal you are assessing conformational traits, symmetry and gait.

Appraise as follows

1. **Front view of alpaca** you will see

- front legs (joint angulation)
- chest
- gait
- bone
- head



Whilst the alpaca is walking towards you watch movements of the feet and legs. If the toes are pointed out it may mean that there is closeness at the knees or turned out at the fetlock (ankle). If the rear toes are pointing out it may indicate "cow hock" (closeness of the hocks). Also be aware of the movement of the legs to help assess gait (rope walking, winging etc).

Assess the width of the chest for base narrow/wide. You also carry out a preliminary appraisal of the head whilst viewing the alpaca parading before you.

2. **Rear view of alpaca** you will see

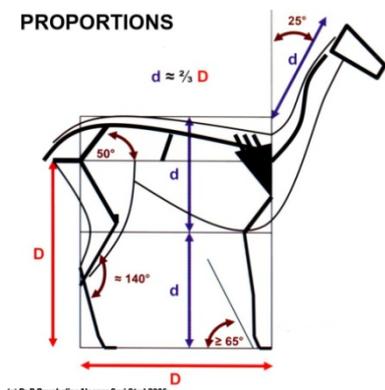
- rear legs (joint angulation)
- gait
- breadth of rear
- tail set



When assessing the alpaca walking away from you, watch the hind legs for conformation, particularly any signs of hock disorders. Again the toes give a clue. You will also get a good view of the gait as it walks away. Check the width of the rump again for base narrow/wide.

### 3. Side-on view of alpaca

**PROPORTIONS**

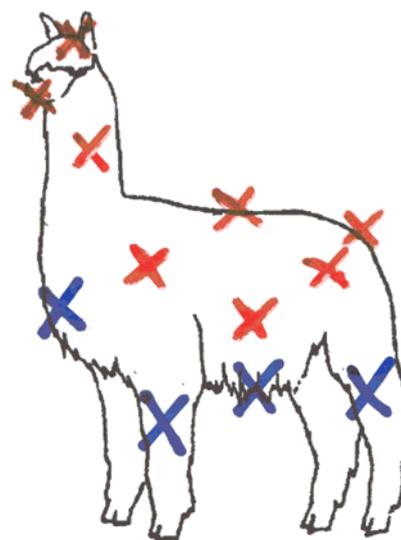


- symmetry (box format)
- back straightness
- tail set
- head
- gait (length of stride)
- legs
- pasterns

As the alpaca walks side-on to you imagine the box example. Check for correct proportion (symmetry). Watch the length of the stride e.g. short, choppy strides which may come from straight shoulders, post legged etc of the long over reaching stride that may indicate too much angle to the hip or back. Pasterns are evaluated at his point. You must check the backline for fault (sway/roach). The length of the backline is also appraised at this stage.

### **HANDS ON INSPECTION PROCESS**

You should develop a consistent process for your hands on inspection. You should start at the head feeling the softness of the muzzle and ears. This is a good indication to the handle of the fleece. Although this process will be the same for the huacaya and suri there are some extrinsic differences.

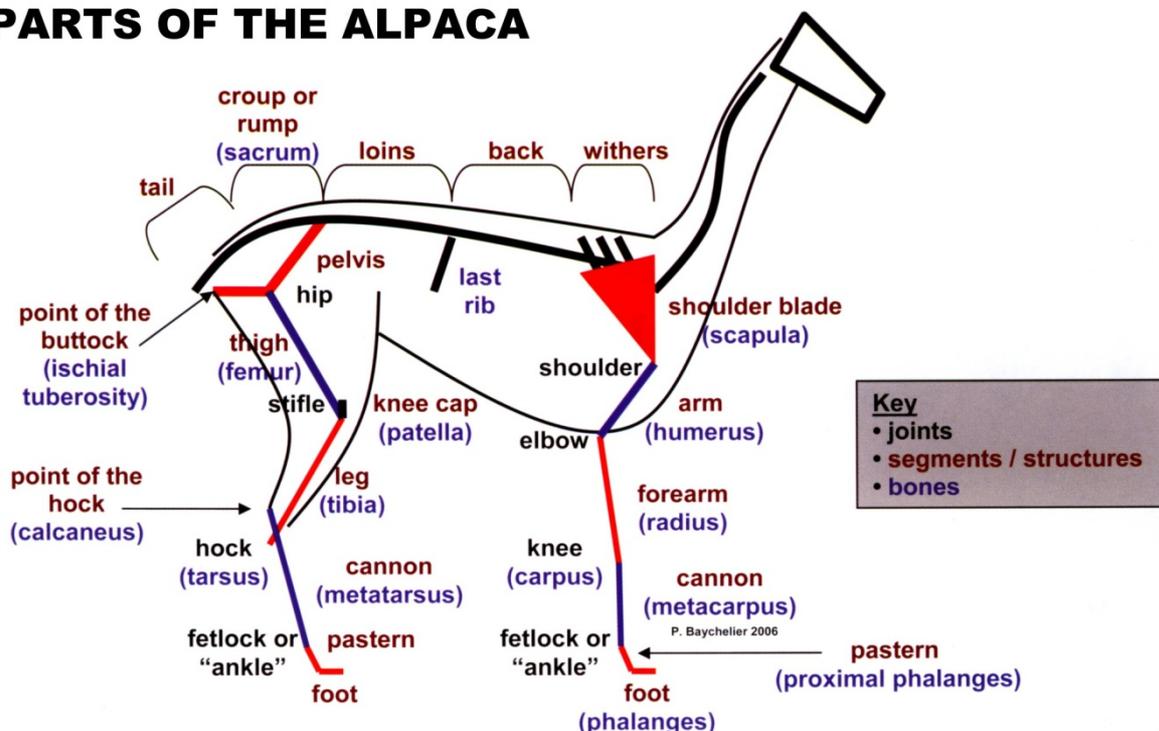


Now moving on to the neck, shoulder, midside, britch area, the base of the tail and coming back up checking the backline.

I would then inspect the apron, legs and belly. Now is a good time to check “spring of rib” and body score before moving on to the genital area.

# PRACTICAL EVALUATION

## PARTS OF THE ALPACA



(P Baychelier)

### Constitution

Constitution is the mental and physical condition of the animal which gives it the ability to survive, grow, breed and produce fibre (in that order).

### Conformation

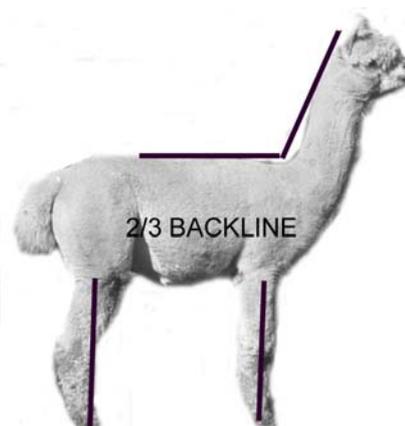
Conformation is defined as the manner of conformation; structure, form or shape symmetrical disposition or arrangement of parts.

## ALPACA CONFORMATION

The following comments are made on the understanding that very few alpacas have the perfect conformation. It is however important to know what the most correct conformation for this camelid is. Not all conformational traits are important to the well being of the alpaca but aesthetically they are obvious to the viewer

The ideal functional Suri and Huacaya should be correctly balanced and proportioned (squared off appearance – see later) displaying a proud and alert presence and should “walk tall”

The neck should be approximately 2/3 of the length of the backline with the legs being approximately the same length of the neck. The legs should, when viewed from the front and rear, appear relatively straight. When viewed from the side the front legs should be relatively straight with the rear legs slightly bent.



## PARTS OF THE ALPACA

### HEAD

**(Huacaya)** The muzzle and jaw should display a medium length triangular shape with the muzzle having a broad soft velvet like handle. The male should display more masculine features.



(photo Mecklem 2005)



**(Suri)** Although the face is open it may be covered with short fine lustrous fibre. The topknot area of a suri grows fibre, which hangs down, similar to a fringe over the forehead, falling down onto the face.

**The ears** should be spear shaped, again with the same soft velvet handle of the muzzle. They should display a medium length and should stand erect and when the animal is alert the ears should be pointing slightly forward. Although the ears do not affect the health of the alpaca, serious faults i.e. gopher and fused ears are heritable traits that should be avoided. There should be plenty of width between the ears and the eyes. Note that the suri can have up to 2cm more length in the ears when compared to the huacaya,

The eyes should be predominantly brown or black, oval in shape and appear alert. Fibre around the eye should be short enough to allow the alpaca to see.



Eye faults that should be looked for are "Entropion." This is where the lids roll in so the lashes rub on the eye. The reverse can happen. This is called "Ectropion" and here the eyelid rolls out.

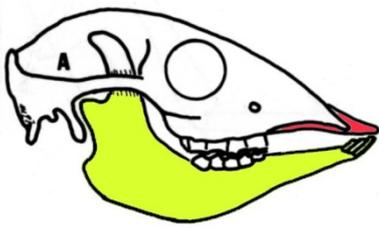
Anecdotal, research evidence (E. Paul) and a study by D Anderson and P March (2002), where they state "Congenital deafness is prevalent in camelids, with a white hair coat and solid blue eye colour (approximately of animals with solid white hair coats and solid sky-blue to white eyes are deaf)".



90%

This data strongly suggests that true blue eyed whites have close links with congenital deafness

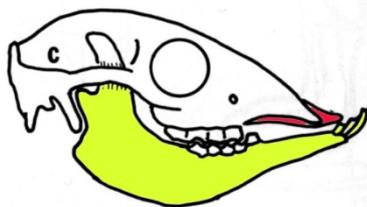
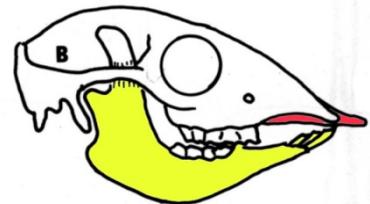
The bite of the alpaca is important to its ability to feed. The jaw should fit together with the incisors meeting the dental pad just back from the front (maximum 5mm)- (A). Dentition problems are described as "Superior Prognathesism" (under shot jaw - B) and "Inferior Prognathesism" (over shot jaw - C).



(A) normal



under-shot (B)



over shot. (C)



(Drawings from Fowler 1995... photos Dickson 2004)



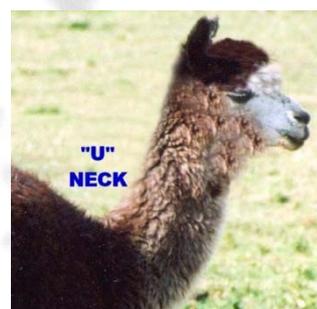
**Faults** – over (>3mm) and under shot (>5mm) jaws, roman nose, wry face, forward set ears, fused ears, gopher ears, banana ears, long ears, long muzzle, narrow muzzle.

**FUSED EARS**

**NECK**

The neck should appear long, slender and upright blending smoothly into the shoulder, and as mentioned earlier should be 2/3 of the backline in length.

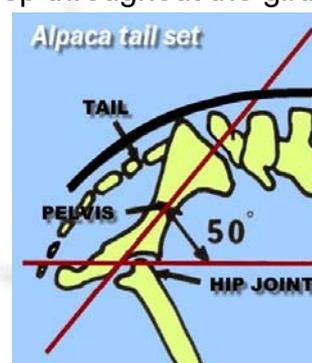
**Faults** – short or long neck, U neck, bent neck.



**BODY**

The body should display well-sprung ribs therefore being deep throughout the girth. The chest should be deep and broad and should be relatively wide at the wither where the shoulders meet, and between the front legs (vital for lungs and heart).

The top line is very slightly convex, sloping down at the rear to give what appears to be a rounded rump with a low tail set. The angle of the pelvis (P) to the spinal column is around 50 deg for the alpaca hence the rounded appearance as compared to the straighter tail set of the llama (40 deg)



(Drawing adapted from Fowler 1995)

**The tail (viewing from the rear)** should be straight and free of abnormalities. The tail should be long enough to cover the genital area.

**Note – A kinked or abnormally bent tail is a moderate fault when it cannot be manually manipulated.**

**EXAMPLE:**

- A “J” hooked tail of the last vertebra.
- A bend or kink in the balance of the tail.

Note – a bump on the end of the tail is not considered to be a fault.

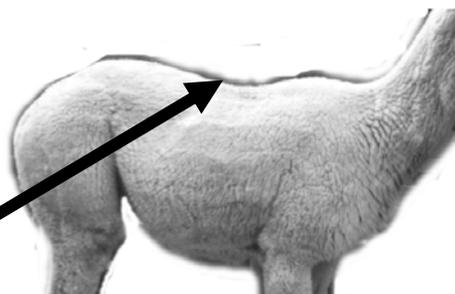


**Any bends to the tail which can be straightened are not considered a fault**

**Note – A kinked or abnormally bent tail is a fault when it cannot be manually manipulated**

The rump should also be broad with a good distance between the pin bones. The height of the pin bones are similar to that of the shoulders.

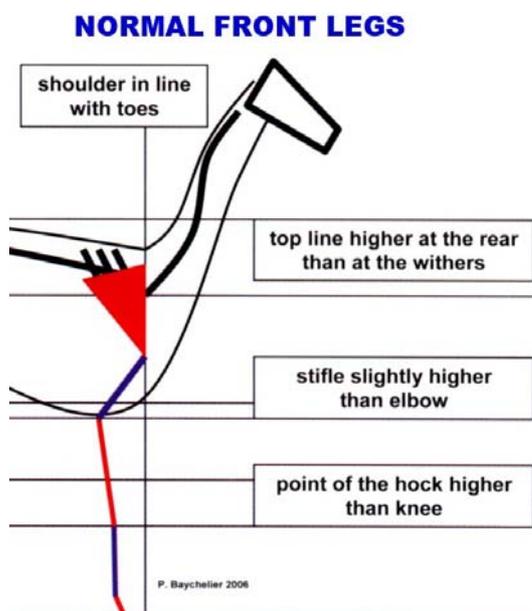
**Faults** - Over long or short back line, straight back, roach back (humped back – can have an excessive slope to the rump along with an appearance of a very low tail set), sway back, high tail set (Llama like), crooked tail (kinked), short or long tail, narrow chest, weakness in the wither (either high or low), narrow hind quarters, steeply sloping rump, high rump. In/out at shoulders.



**SWAY BACK**

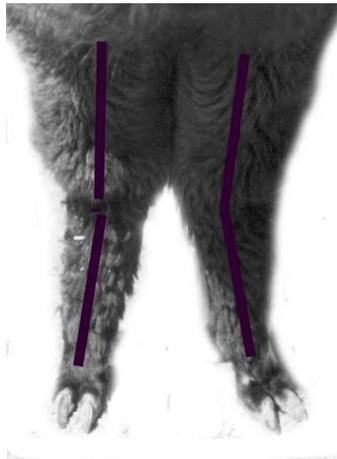
**FRONT LEGS**

Viewing from a front on position, the front legs should be relatively straight with an imaginary line going from the mid point of the shoulder through the knee to the toes. The toes should not toe in or out but appear to point forward. When viewing from the side you should see some angulation at the shoulder and elbow. An imaginary plum-line should pass down the front of the elbow, through the knee and down through the fetlock.



**NORMAL / GOOD LEG STRUCTURE**

(Drawing adapted From Baychelier 200



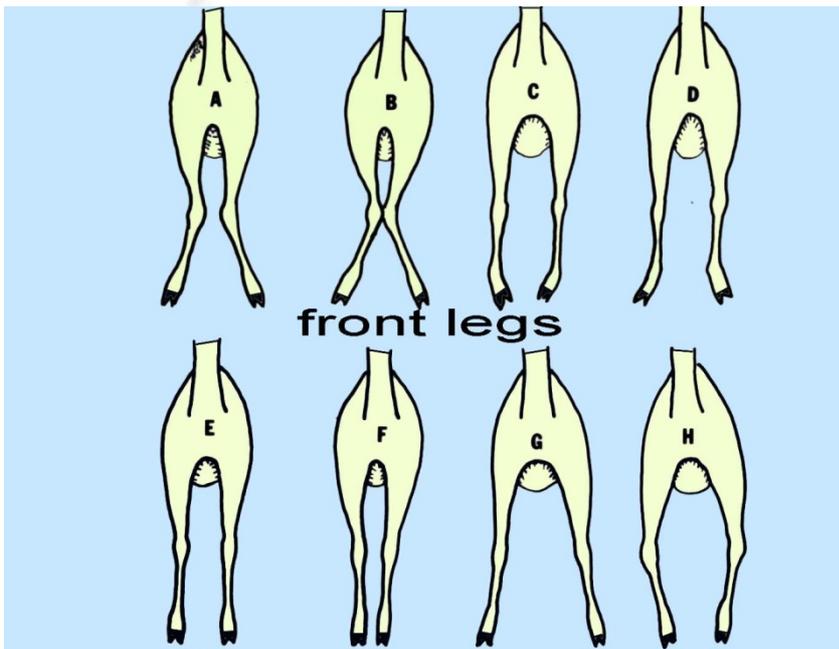
**SLIGHT  
KNOCKED KNEES**



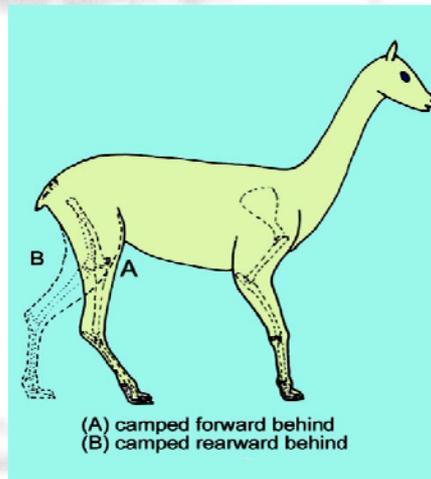
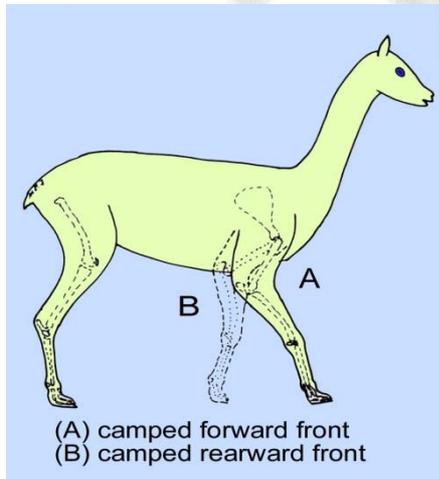
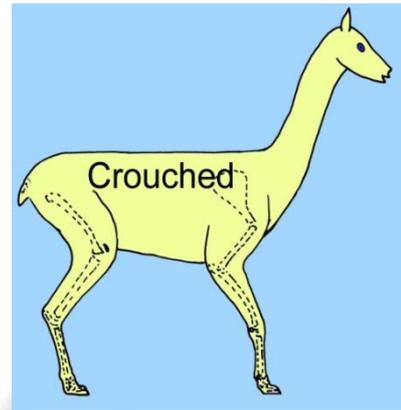
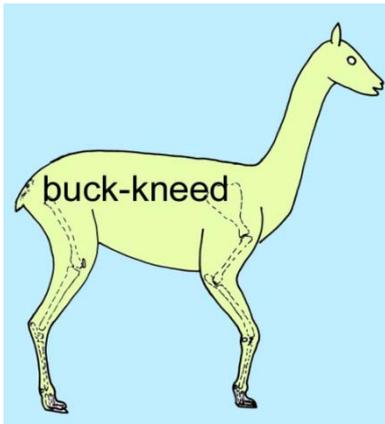
**MODERATE  
KNOCKED KNEES**



**SEVERE  
CALF KNEED**



- A. Moderate knock knee**
- B. Severe knock knee**
- C. Pigeon toed**
- D. Splayed foot**
- E. NORMAL**
- F. Base narrow**
- G. Base wide**
- H. Bow legged**



(Drawings adapted from Fowler 1995)

**Faults –**

cocked or dropped pasterns, calf or bucked kneed, pigeon toed or splayed, syndactyly (fused toes), polydactylism (more than two toes on a foot).



Syndactyly

(photos Holt)

(photo Dickson 2004)  
polydactylism

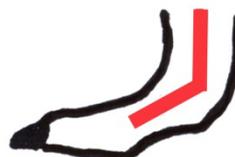
## PASTERNS



normal



cocked



dropped

It is possible for calf knees to cause cocked pasterns and buck knees could cause dropped pasterns.



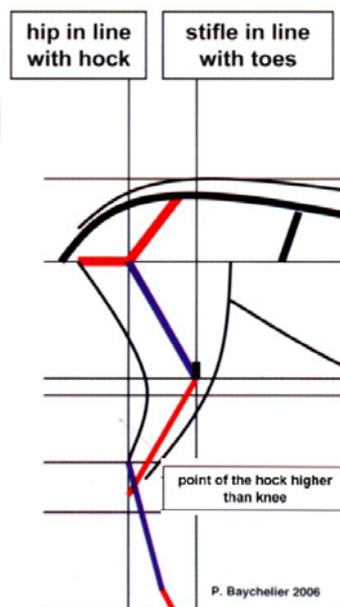
**DROPPED PASTERNS**

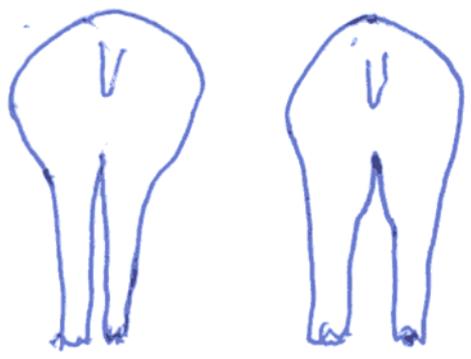
## REAR LEGS

The rear legs are straight and parallel. This should be seen when looking at the rear stance of the animal. The legs should not slope into a “narrow” stance or vice versa into a “legs apart” stance. Viewing from the side the legs should display a slight sickle hock (not to be confused with the fault “sickle hocks”).

(Drawing adapted from Baychelier 2006)

## **NORMAL REAR LEG**



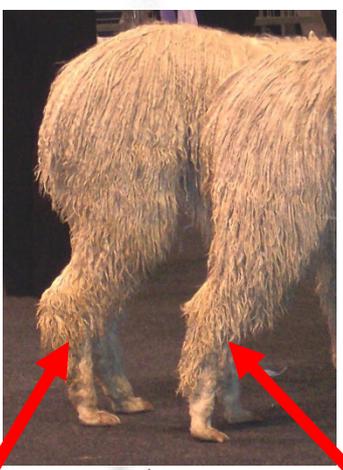


**BASE NARROW**

**GOOD STANCE**



**BASE NARROW**



**SLIGHT SICKLE HOCK**

**CAMPED REARWARD BEHIND**



**MODERATE SICKLE HOCK**

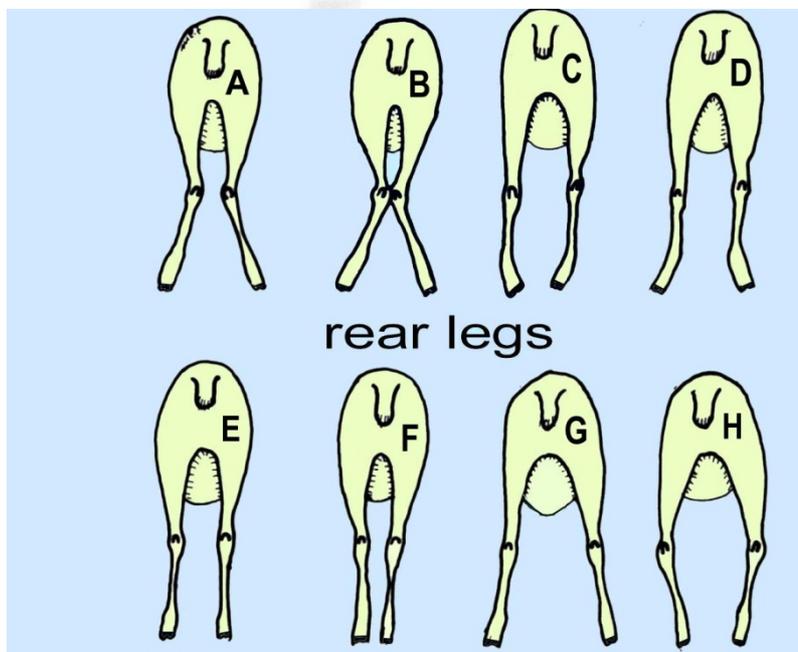
**SEVERE SICKLE HOCK**





MODERATE COWHOCK

SEVERE SPINE DEFORMITY DUE TO COWHOCK



rear legs

- A. Moderate cow hock
- B. Severe cow hock
- C. Pigeon toed
- D. Splayed foot
- E. NORMAL
- F. Base narrow
- G. Base wide
- H. Bow legged

(Drawing from Fowler 1995)

**Faults** – cocked or dropped pasterns, sickle hocked, cow hocked, camped out behind and camped under, base wide and base narrow, narrow hindquarters, post (straight) legged, luxating patella, syndactyly (fused toes), polydactylysm (more than two toes on a foot).

It should be noted that when the alpaca becomes frightened or tense it is possible for the animal to crouch which may give an appearance of sickle or cow hocked in the rear legs. If in doubt it may be necessary to parade the alpaca again to reassess.

**REPRODUCTION**

**Female –**

The udder should show good capacity with four working teats with the vaginal opening being in a vertical position as compared to a horizontal position and should be covered by the tail.

**Male –**

The testes should be even in size and easily visible in the scrotum as well as being firm, not too hard or not too soft. It is suggested that when they are fully developed in an adult male they should be approximately 4cm in length and 2.5cm in width.

**Faults –** cryptorchidism (undescended testicle), hermaphroditism (both male and female organs), uneven testicle size.

**Hermaphroditism**



(Photo Dickson 2004)



▲  
Less than four teats and or the presence of one or more supernumerary teats that could interfere with the normal function of the four normal teats and or inverted teats.

(Photo Holt)



Note – the presence of one or more supernumerary teats is accepted provided they do not interfere with the normal function of the four normal teats

**GAIT**

Gait is basically determined by the conformation of the alpaca. The legs should travel in a straight line moving freely and evenly in a forward motion. Toes on all legs should face forward as the alpaca moves. Although alpacas have five natural gaits, walk, pace, trot, gallop and the shott (a playing gait), the main two are:

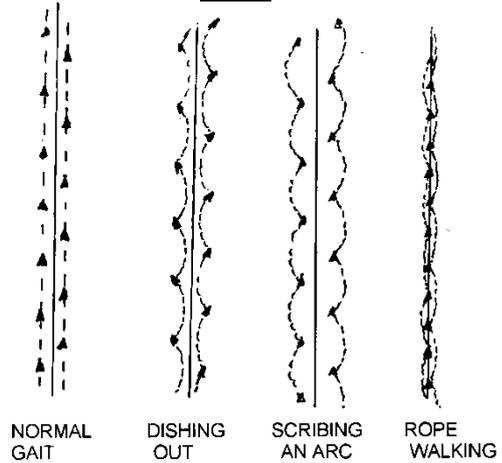
- (a) Walk (which is a four beat gait). Whilst walking the alpaca will place each foot separately and in sequence. Three feet are always on the ground.
- (b) Pace, when at a medium speed, the gait is two beat. Here the front and hind legs on the same side move in unison.



When the alpaca is in a "trot" gait (also a two beat gait) the diagonal front and rear legs move in unison. The walk and pace gait are considered the main stride.

**ROPE WALKING**

**GAIT**



**WEIGHT, HEIGHT AND BONE**

There are various opinions on minimum and maximum weights and heights of alpacas. Finer micron animals may have a slightly smaller frame therefore decreasing height and weight slightly. Mature adult suggested weight is approximately 60 - 75kg with a height of approx 90 cm taken at the wither.



**GOOD BONE STRUCTURE**



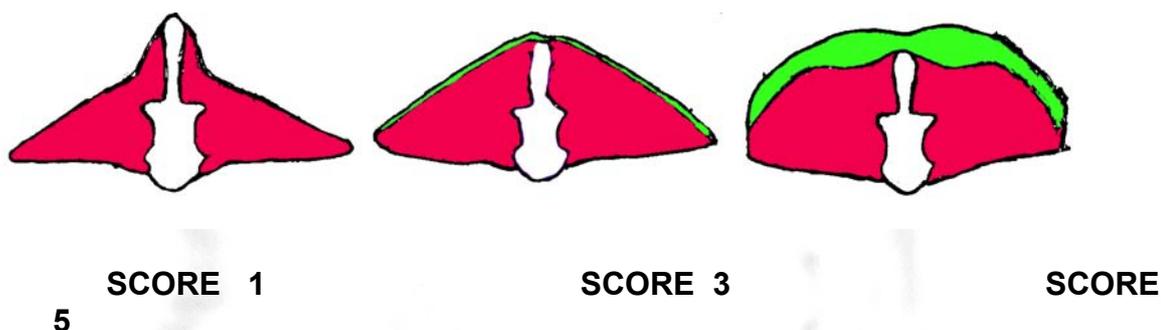
**LIGHT BONE STRUCTURE**

The bone structure should be medium to heavy, as strong structured legs are necessary for the physical requirements of their daily routines.

## BODY SCORING

Body scoring will give you an indication of the condition of the animal. Assessment should be carried out over the spinal area.

Palpate for amount of muscle as exemplified below (Score 1 – 5)



Palpating the rib area behind the elbow, the brisket region between the front legs and around the perineal region will also assist in this assessment.

## FLEECE

### - FIBRE COVERAGE

#### Huacaya



The Huacaya should have a soft, dense fleece which grows perpendicular to the skin (similar to a merino or polwarth sheep). The fibre should grow down the legs maintaining consistency of character and fineness. The neck wool should exhibit similar quality of fibre but will be shorter in length. The head cover should grow up over the top knot and also on the cheek area of the face. Although this wool is short some evidence of crimping should be seen. There should be minimal medullation throughout the main fleece growing area.

**DESIRABLE**

(Not in order)



Fineness  
 Density  
 Character of Crimp  
 Handle Uniformity of - Fineness

Character  
 Absence of Guard Hair  
 Brightness  
 Coverage e.g.  
 Leg  
 Head  
 Dense backline

**SURI**

The Suri should grow a very lustrous silky dense fibre which hangs vertical to the body (similar to that of a mohair goat). Although the face is open it may be covered with short fine lustrous fibre. The top knot area of a suri grows fibre which hangs down similar to a fringe over the forehead, falling down onto the face. The style/character in the fleece should be maintained from the forehead all the way down through the body to the lower leg. There will be an increase in micron in the apron area.





Suri locks should open freely and not be tangled or matted. In other words the integrity of the lock should be maintained.



It has been noticed on a number of Suris that the fibre growing on opposite sides of the body is of a different lock type. To be true to type the fleece should be similar on both sides.

Left and right side of neck  
NOTE different fibre type



**DESIRABLE**  
(Not in order)

- Fineness
- Lustre
- Density
- Lock formation (no crimp)
- Evenness of lock formation
- Coverage e.g. Legs  
Head
- Absence of guard hair



**Negative Fleece Traits**

- Tender – weakness in staple
- Lack of uniformity – Fineness  
Lock/staple  
Density

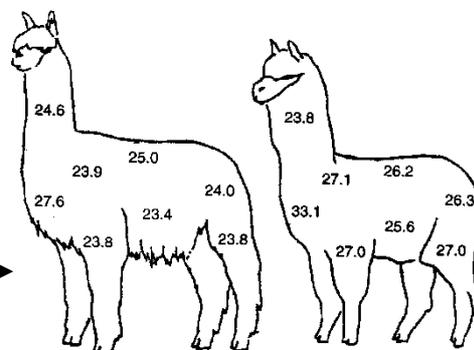
- Brittle/coarse fibre
- Cotting (matting)
- Excessive guard hair
- Tip damage
- Suint stain
- Chalky fibre

- Huacaya – lack of crimp
- Suri – highly crimped

## WHAT YOU SHOULD LOOK FOR WHEN ASSESSING FLEECE

To help you understand Alpaca fleece assessment I will give you an indication of what I look for in the various categories, but first I would like to go through the areas of assessment and discuss the relevance to you the breeder as well as the processor.

### MICRON VARIATION OVER THE BODY



### OPENING THE FLEECE



There is an art to this and it is very simple. Just part the staples or locks using your index finger and thumb. You can if necessary use the middle finger in support. The staples do not need to be spread apart to their maximum but just opened enough to see those characteristics you



are appraising.

As you inspect all the sites mentioned earlier, you will look for evenness and consistency throughout the entire fleece. In the case of huacayas you are looking at the evenness and definition of the crimp, fineness and handle, brightness, absence of medullated fibre (guard hair) and the density of fibre growth. You should make sure the fibre type being grown is correct for the animal. Evenness of length is also to be checked.

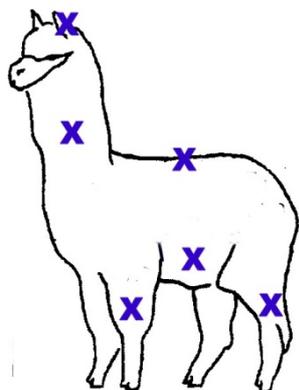
In the case of suri's you are looking for consistency of lock style and formation along with evenness of lustre throughout. The other characteristics mentioned above are assessed when opening the fleece

## **COVERAGE**

**Like density and length overall coverage adds to total fleece production.**

**Check for:**

good leg cover, looking for the fibre on the legs to be growing down onto the shanks.



There should also be good cover on the head, and fullness on the cheeks – check the bonnet.

The Huacaya fibre should be dense growing upright whereas in the Suri it will lay flatter on the head.

Also check for length of fibre on the neck.

The belly should be inspected as a well covered alpaca should also have good belly growth.

Inspection of the back line should also be done to see if it is open or dense. The Suri backline is open due to the way the fibre hangs down the flank of the animal.



**GOOD COVER**



**LIGHT COVER**

Now standing back you view overall coverage and check leg formation. Having completed the physical inspection of the animal you should check any records that contain measurement data e.g. micron, CV, fleece weight as well as health and reproduction reports (if available).

## PARTS OF THE BODY

### ***Topknot (H)***

The topknot (bonnet) should show some evidence of crimp and brightness. The fibre is short.

(S) As mentioned earlier the locks hang down forming a fringe over the forehead falling down onto the face. They should show the same locking formation as shown on the main part of the fleece. The locks, longer than the huacaya, are still shorter in comparison to the balance of the fleece.

### **Neck – 5 (H)**

Here the length should be at least half that of the body of the fleece. It should show all the same characteristics you would expect to find in the blanket area.

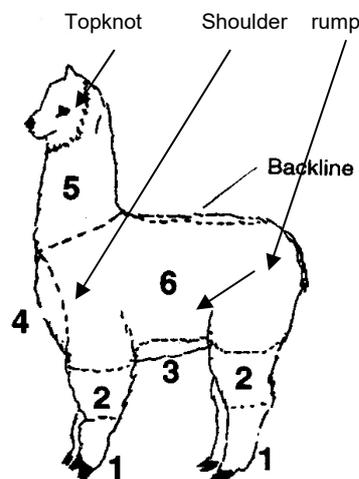
(S) Again shorter than the blanket area but should show good lock structure and lustre as expected in the balance of the fleece.

### **Shoulder/Midside – 6 / Rump**

This is the main part of the fleece (blanket). There should be evenness of all characteristics for both huacaya and suri.

(H) This fleece should exhibit good well defined crimp and staple structure. The fineness should be consistent throughout although as it moves closer to the middle leg area some increase in micron may be observed. Brightness/sheen and density should also be constant.

(S) Here the locks should be individually growing, parting from the backline and hanging loosely down each side of the alpaca. They should be dense of correct lock type and open freely showing no signs of matting (cottedness). When the alpaca is overfleeced matting can occur. Like the huacaya we expect the fineness to be consistent through this area. Lustre should also be constant and void of chalky fibre.



**Backline**

(H) the backline should be dense and not open like the suri. It should still exhibit those good characteristics found in the blanket. Some vegetable matter is to be expected. Between the shoulder blades, sometimes referred to as the crow's nest, heavier quantities of V.M. may be found. This should not be in a show animal.

(S) This area is open as the fleece parts and hangs down either side of the alpaca. The style of fleece and locking should be evident as expected in the balance of the fleece.

**Middle Leg – 2**

For both huacaya and suri the character and style is still expected but coarseness of micron is likely to increase along with a possible increase of guard hair.

**Belly – 3**

Not unlike the middle leg area but probably not as dense.

**Apron – 4**

The most medullated part of the alpaca. The smaller the apron area the more desirable.

## OVERVIEW OF FLEECE TRAITS

### FINENESS

Micron is probably the main characteristic to the processor as it is of any fibre group. The micron determines the fineness of the yarn and when producing fine micron fibre/yarn, soft lightweight fabrics can be produced. Micron accounts for 70/80% of value in the processed top. The fineness of fibre you are breeding in your herd must be considered if you reflect on what the end product that the fibre is to be used for. Breeders should be aware of the average micron of each animal in their herd not only to identify those finer or superior types, but those that are undesirable for the owners breeding goals. The fineness of the micron will determine the final use of the fibre and in some cases how the fibre is to be processed, that is whether the Alpaca is to be blended with another fibre e.g. wool or processed by itself.

### HANDLE/SOFTNESS

This is in my opinion one of the main assets of Alpaca fibre. The softness is usually due to the micron of the fibre but when comparing Alpaca with wool we have a major difference. The cuticle cells (outer) on wool protrude approximately 0.8 of a micron (scale height) compared to Alpaca that protrudes approx. 0.4 of a micron. This gives a feel of around 2/3 microns finer (softer) than the equivalent micron in wool. With some lustrous Huacaya fibre and Suri fibre you can get also a more slippery feel due to the

scale frequency per 100 microns being lower. These characteristics are advantageous to Alpaca not only from the softness angle but also from the ability to wear Alpaca fibre on the skin. You would assume that the prickle factor which applies to wool with 5% of fibres over 30 microns, may not be as severe on the equivalent Alpaca fibre, although if the yarn has a lot of coarse fibres through it this may not be the case. The prickle factor is caused by coarse fibre ends touching the skin triggering pain receptors just below the epidermis layer. A low CV will also add to the “kindness to hand”. A low CV fibre usually has fibres more similar in fibre thickness, therefore being softer to handle.

## LUSTRE

Good lustre is an important characteristic for Suri fibre. It is one of the main attributes, as this is what is required in a finished garment of Suri or Suri blend yarn. In Huacaya a “brightness” or sheen is desirable by the processor again for the finished garment. It is therefore important for the breeder to be able to identify chalky type fleeces and either breed this fault out or sell the animals concerned.

A good way to assess lustre is to place half a staple firmly over your thumbnail.

## COLOUR

Much debate has taken place about whether to breed for colour or white. White is a good universal fibre which can be dyed according to fashion trends. There are those processors who like natural colours. It is the breeder’s responsibility to determine their direction. The main requirement of the processors is that the colour is pure, **that is not contaminated by odd fibres of another colour** (excluding roan/grey).

## CHARACTER (CRIMP)

Crimp is important in processing. Huacaya fibre, unlike Suri, exhibits varying degrees of crimp/crinkle in the fleece.

High frequency crimped wools (greater number of crimps per inch) enables the processor to produce bulky woollen yarns where as the bolder low frequency crimped wools (less number of crimps per inch) of a similar micron tend to be smoother and leaner and have a kinder handle. These wools where their length is above 75 mm are desirable in the worsted system. Dr. Jim Watts has identified that certain types of crimps with deep crimping usually have more uniform fibre structure, density length and lustre.

Wools with crimp (crinkle) allow the processor to spin a yarn which is lighter due to its bulking properties in the yarn, it also helps in promoting improved cohesion of fibres whilst processing. Research has shown that staples with well-defined crimp tend to have a lower CV and therefore are softer to touch. A lower spinning fineness is also achieved. This should be a “major selection criteria” for breeders.

## STYLE

Suri fibre is basically a straight fibre and like mohair is used in specialised fibre production. Processors would prefer the Suri fibre not to be straight but have a “light

wave". From the breeding prospective Dr Julio Sumar would prefer the ringlet type followed by the lock with twist and wave.

## LENGTH

Evenness of length is important in processing as is the overall length of fibre e.g. Huacaya, Woollen System 20mm/50mm (1 inch/2 inches). Worsted length ranges from 50mm up but not over long. Suri fibre is all processed on the worsted system. It is noticeable in Peru that the processors have their machines set for different lengths compared to Australia and USA. This is due to the higher nutrition levels in the latter consequently growing longer fibre. Breeders should select animals that do not have short fibre growth over 12 months (compared to other alpacas on the property – if all are short you probably have a nutritional problem).

## DENSITY

This is basically not of interest to processors, but very important to breeders for total fleece production of a given animal. Density not only helps keep out vegetable matter and dust but adds to fleece weight.

## IMPURITIES

Impurities like heavy dirt and vegetable matter have to be removed by the processor. The more the problem the greater the cost. Also the dirt can help break away the tip of the staple increasing noils (very short fibres combed out of longer fibre). Stain is also a problem as stained fibre will not dye the same as clean fibre. Tender (broken fleece) fibre adds to noils and can lower the top length – these are husbandry and breeding problems the breeder needs to address.

## LACK OF GUARD HAIR (MEDULLATION)

Guard hair fibres are generally not desirable in the finished product. They are stiff and hollow with pointed tips. They reflect light differently to solid fibres and are hard to control when spinning. A large number of these fibres are removed during the carding/combing process but a number still remain and these are a contributor to the coarse edge which gives the "prickle factor" in garments and being stiff they will protrude from the yarn. A Harris Tweed would welcome this effect. **The numbers of medullated fibres can be measured by the O.F.D.A.100.** A Histogram of medullated fibres is superimposed over the solid fibres and records the various diameters and spread. Dark coloured fibre is more difficult to calculate and results for these colours should not be used as a reliable tool.

## CLEAN FLEECE WEIGHT

This is of great commercial value to the breeder. The more weight of a given micron the more return in dollars. The processor pays by the LB/kilo and is not worried how many animals it takes to produce the weight. In all fibre industries fleece production per animal is a major selection and economic criteria (like fineness).

In an interview I did in 1998 with Dr Julio Sumar I asked him “When selecting alpaca animals what are the most important characteristics you select for?” He replied “In Huacaya my most important characteristics are fineness (I reject animals 28 microns and above/broader) and density/fleece weight. Other areas that are of equal importance are the character/crimp, length, uniformity, lack of guard hair and no dark fibres in the white fleece. In the suri there is much less variation between animals and the important characteristics are fineness, density and lustre. The length is normally OK growing 10-16cm per year. Suris have much less medullated fibre than Huacayas.”

## ANIMAL ASSESSMENT FOR FLEECE

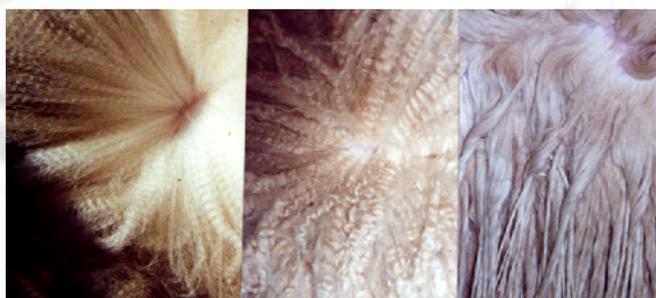
When assessment is carried out on the Alpaca, the fibre will be inspected for :

- fibre type
- brightness (sheen / lustre)
- colour
- fineness
- length
- medullation content
- crimp/style
- tensile strength
- staple/lock formation
- density
- coverage

When assessing the fibre use a contrasting background, e.g., white on black and coloured on white, to clearly see the fibre characteristics.

### FIBRE TYPE

- Huacaya
- Huasu (chili)
- Suri



### BRIGHTNESS (SHEEN / LUSTRE)

This relates to the light refraction of the Alpaca fibre taking into account breed type.

Huacaya fibre should possess a brightness or sheen whereas a Suri fleece should possess a high degree of lustre. Chalky fleece should be avoided. The in-between fleece type, Huasu ("Chili") has a lustre somewhere between the two main breeds.

Rate as

- High
- Good
- Average
- Dull/Poor (Chalky)

**TOP** good lustre (hua)

**BOTTOM** dull (hua)



*equally lustrous.*

An influence on the assessment of lustre is the effect of yolk.

**Yolk is a combination of suint and wax. The suint tends to create a creamy looking colour when in fact the fibre is white.**

*Both these fleeces when washed were*



## COLOUR

As per Registration or classing house standards

The evenness and regularity of colour throughout the entire fleece, is desirable. I take into consideration the attributes of light fawns and greys when assessing this area. White fleeces with the odd black or brown fibre throughout the staple should be identified.. This also applies for black and brown with white contamination. This does not apply to grey or roan fleeces.

There are outside influences that effect the expression of colour. One of these is the environmental effect known as “district colour”. This comes from the dirt (loam) that adheres to the fibre. Many people wrongly appraise white fibre into light fawn when alpacas have been running on a clay base.

## GUARD HAIR CONTENT (MEDULLATION)

The fleece should be as free as possible from those broad continuous guard hair fibres (very straight, hair like fibres). Some tolerance may be made in the older animals as more of these appear in the fleece as the micron gets broader, e.g. over 30 microns the britch fibre appears to be the offending area in a number of fleeces. You should be aiming to reduce the guard hair through the APRON area.

Suri fleece is not as medullated as Huacaya fleece for a similar micron, and therefore not as big a processing problem.

Micron	Huacaya	Suri
20	12.9%	4.7%
26	36%	16%
36	60%	42.4%



When the guard hair type of medullation is present, a way of estimating the content is to hold the tip firmly in the right thumb and forefinger and the butt end loosely in the left thumb and forefinger. Then by gently pulling of the right hand away from the left those long straight medullated fibres will be removed. You should then open up the staple on a contrasting background and gauge if any medullated fibres remain.

(for stud purposes a ranking of F.L.M.H. for guard hair can be given.)

- F free or nearly free
- L light
- M medium
- H heavy

### **STAPLE/LOCK FORMATION**

The structure and shape of the staple/lock can be an indicator of various characteristics that are evaluated when preparing and classing the fleece.

Factors that influence the structure start with the genetic background of the animal. The animal can be a well crimped dense Huacaya Llama or Suri ancestry. These genetics will have an influence not only on the shape of the staple/lock, but also will influence the structure within the skin of the animal. The formation found in the skin can contain large primary and smaller secondary follicles, as found in Alpacas with a Llama ancestry, or the follicles may be similar in size, having a very compact distribution within a square centimetre.



It has been found that the largest follicles grow the thicker fibres, which are usually the longest. (They grow more quickly than the finer fibres due to their size). When there is uniformity in the follicle size the fibres tend to grow a similar length. This can be seen with those staple/locks that grow with a blockier tip compared to those that have that spiky tip. Those fibres protruding at the end of this tip will normally be the coarsest fibres in the staple/lock. These could either be, coarse crinkled wool like fibres, or most likely (in the very spiky types) guard hair type medullated fibres. In other words the greater the guard hair medullation then the greater the likelihood of long spiky tips.

Staple/lock formation will be a guide when visually assessing for fibre type, fineness, density, medullation, crimp, and when removing those hairy britch areas during the skirting process.

**HUACAYA**

These lines should be used for your own recording in your stud.

**FINENESS**

AUST/NZ      U.S.A./CAND

<18 microns	UF	UFB
18- 20 microns	SF	RB
20.1-23 microns	F	B
23.1 -26 microns	M	SF
26.1-30 microns	S	M
30.1-34 microns	EX S	S
34.1 microns & stronger	C	C

**LENGTH**

5"-6"	120-150mm	A
3"-5"	80-120mm	B
2.4"-3"	60-80mm	C
2"-2.4"	50- 60mm	D

***CRIMP***

***Breeder's assessment for crimp should be as follows***

1. **Excellent** – very evenly defined crimp with deep amplitude
2. **Good** – well defined and regular crimp formation
3. **Good/Average** – showing good to average crimp definition and regulation
4. **Average** – showing some crimp definition but not as regular as No 3
5. **Average/Poor** – little crimp definition or regulation visible
6. **Poor/Straight** – no crimp definition clearly visible



<u>10/9</u>	<u>8</u>	<u>7/6</u>	<u>5/4</u>	<u>3/2</u>	<u>1/0</u>
excel-sup	good	g/ave	average	poor	inferior

**FLEECE JUDGES RATING FOR CRIMP**

**Juan Pepper** also said, in discussion with Cameron Holt, “Fibre crimp is highly desired to obtain a good fibre processing, however, its variability depending on the region where we buy in Peru, has pushed our industry to find alternative ways to overcome the lack of crimp we frequently find in some fleeces. Crimp helps spinning and holding fibres together, thus giving a better and more regular product. If crimp can be controlled from the breeding, this would be a very positive issue for the industry”.

**DEFINITION**

**CRIMP FREQUENCY** is the expression of the number of times the fibre crimps (waves) per inch. In good crimped huacaya fibre there is a general relation between crimp frequency and micron, but not absolute.



### AMPLITUDE and FREQUENCY of CRIMP

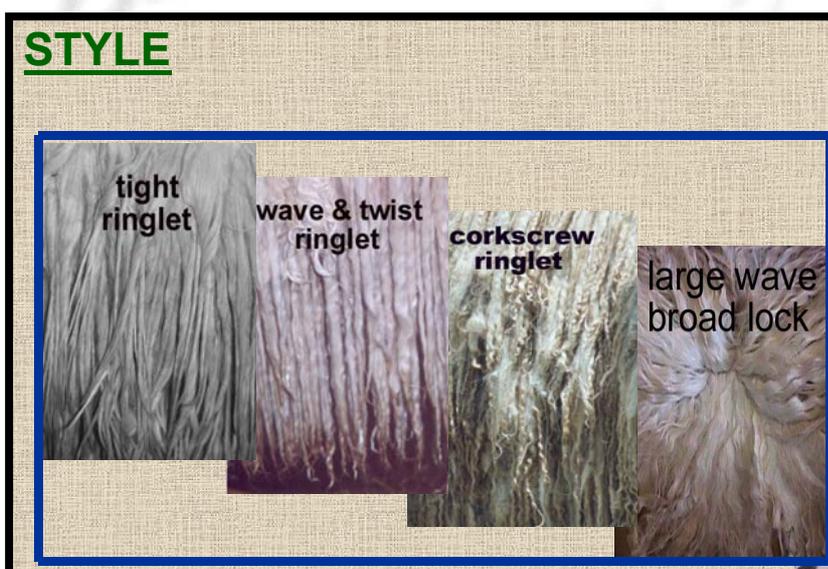
**Amplitude** is the height (deepness) of the wave. Deep crimp is said to have high amplitude.



### SURI FLEECE TYPES

Suri fibre is basically a straight fibre and is used like mohair for specialised fibre production. One of the main difficulties when processing Suri, (like Mohair), requires some twist in the sliver so it will not pull apart during the drawing process. This is due to the lack of cohesion when spinning caused by the low, smooth cuticle scale structure. Processors have suggested that they prefer a fibre with a slight wave in preference to a straight fibre. From a breeding perspective, Dr Julio Sumar would prefer the ringlet type followed by the lock with twist and wave.

Many variations of suri lock type exist. However, **four types are commonly identified**. These range from a tight ringlet, wave and twist ringlet (sometimes known as curled ringlet), corkscrew ringlet and large wave with broad lock. These three would be the most common of the four types with another one being a straight fibred lock.



1. The lock twists into tight ringlets almost to the skin.
2. The lock grows showing a small wave with twist. It also grows in a ringlet formation. The best locks will almost twist and wave to the skin.
3. The lock grows in a corkscrew like curl. It also grows in a ringlet formation. The lock can be small or large.
4. The large wave with the flattish broad lock is a much thicker looking lock than the above three. The thickness does not necessarily mean density.

Within the above four main types (not straight) many variations can be seen. These variations can be affected by the trueness to type of the fibre and can be changed, eg. fanned ringlet, when the fibre becomes excessively over long. Another type of lock sometimes found when breeding Suris is that with a crimp like wave along the length of the staple (Husui). This is a much bolder and wider crimp/wave than found in the Huacaya fibre. This not desirable.

It is most important that the Suri fleece displays high lustre than those that are chalky. These animals producing the chalky fleece should be bred to a male displaying high lustre in its fleece.

**Processors requirements for Suri fibre are**

- lustre
- fineness
- length
- straightish fibre (no crimp)

**SURI**

Suggested stud-recording groups.

**FINENESS**

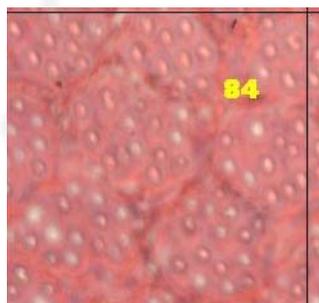
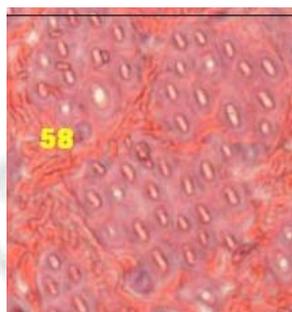
MICRONS	U.S.A. - CANADA		AUST - NZ	
below 20 microns	<i>RB</i>	<i>Royal Baby</i>	<i>UF</i>	<i>Ultra Fine</i>
20 - 23	<i>BL</i>	<i>Baby</i>	<i>SF</i>	<i>Superfine</i>
23.1 - 26	<b>FS</b>	<b>Fine</b>	<b>F</b>	<b>Fine</b>
26.1 –30	<b>M</b>	<b>Medium</b>	<b>M</b>	<b>Medium</b>
30.1 - 34	<b>S</b>	<b>Strong</b>	<b>S</b>	<b>Strong</b>
34.1 & stronger	<b>C</b>	<b>Coarse</b>	<b>C</b>	<b>Coarse</b>

**LENGTH**

LENGTH	INCHES	MM
A	5-6	120-150
B	3-5	80-120
C	2.7-3	70-80
O/L	6-10	150-250

**DENSITY OF COVER AND STAPLE / SOLIDITY OF LOCK**

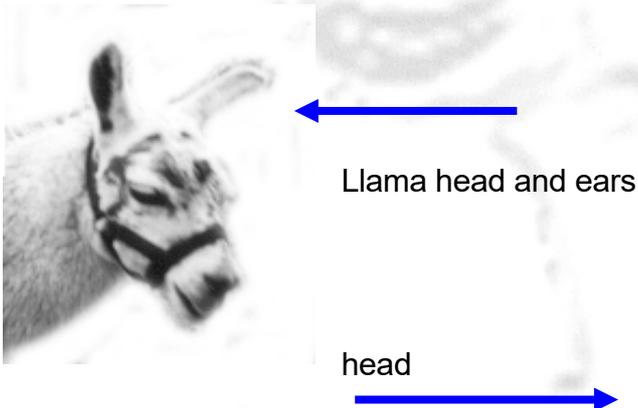
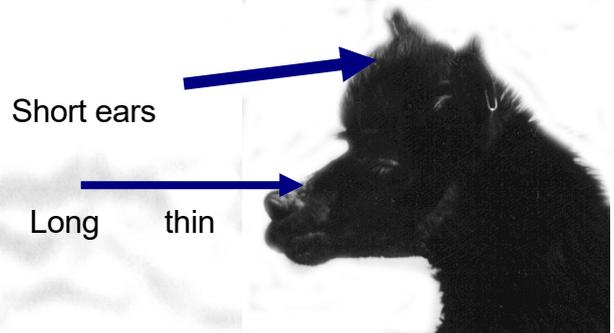
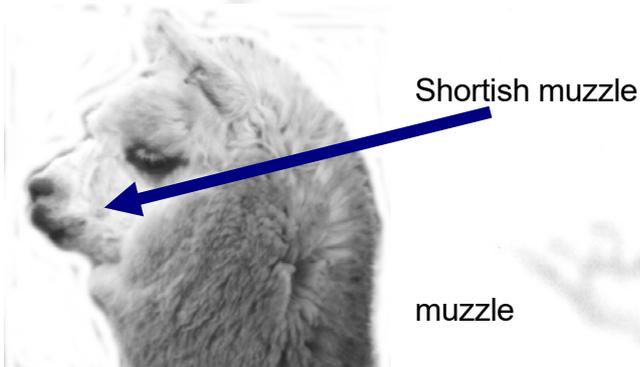
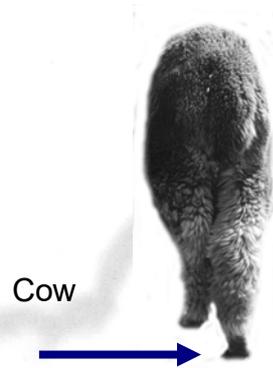
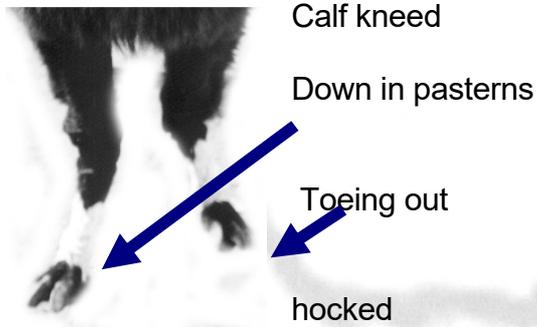
Assessment of density on the animal is not that hard. There is a combination of checks. First “grab a handful and squeeze.” If hands close up there is little density within the staple – if you have resistance then the staple is usually dense. Lock type also has an influence on this assessment. Skin visibility can be misleading, as staple/lock type has the greater influence.

**(DENSITY 84)****(DENSITY 58)**

(Evans 2006)

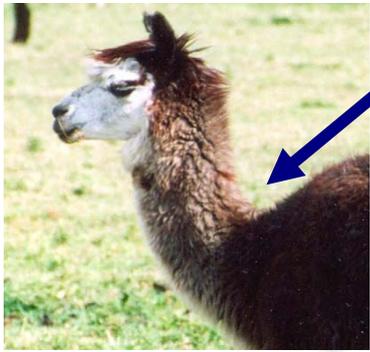
With the Suri lift up the fibre and feel the weight (drag) of the fibre. In discussion with Mike Safley, Don Julio Barreda suggested that a tight thick ringlet lock, which twists all the way to the skin, tends to be the denser.

## EXAMPLE OF FAULTS



Poor suri



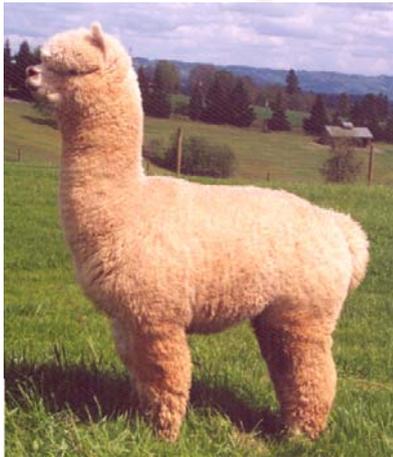


U" Neck head

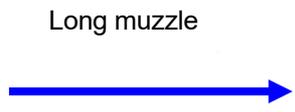


Good suri

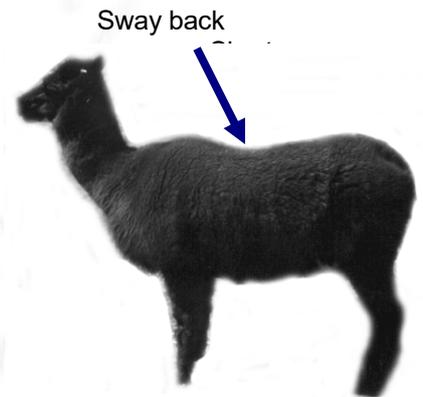
(photo Short 2004)



Good frame



Long muzzle

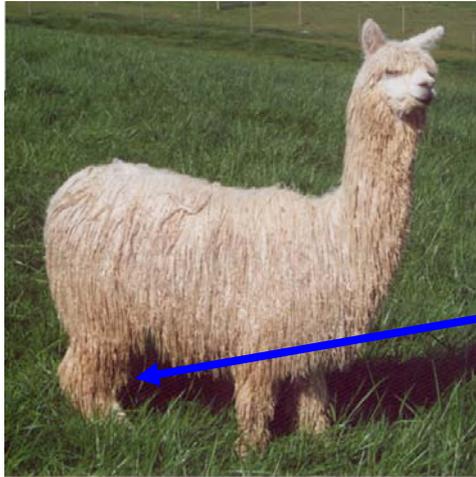


Sway back



Over shot jaw





Crossbred fleece



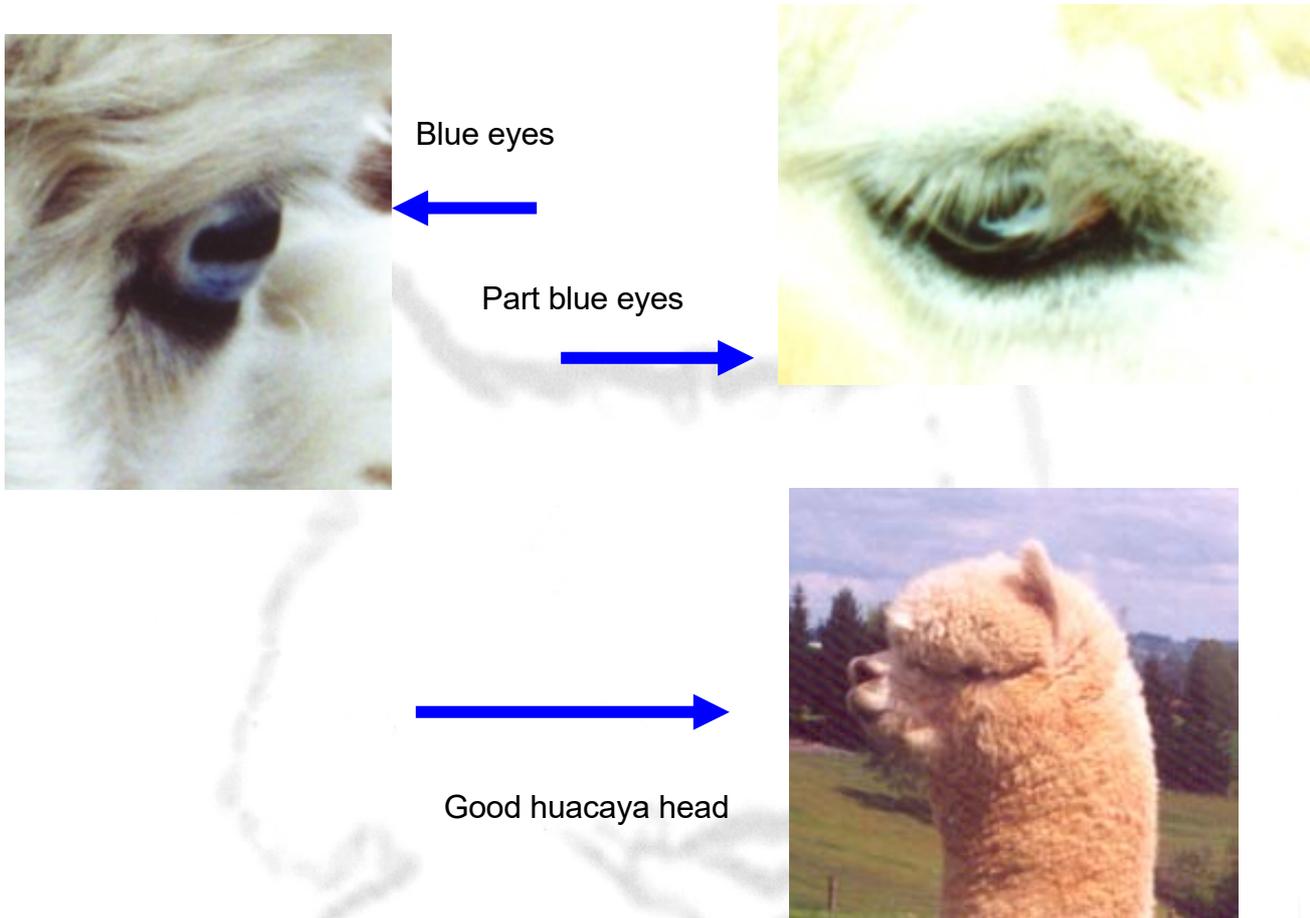
Camped forward Behind & sickle hock



Coarse apron



Plain fibre on neck



**It's now time to go and evaluate some of your animals (if you have any) and get used to "hands on". You should draw up an evaluation sheet based around your perceived criteria that is important to you.**

**Some example sheets, some of which include selection indexes are attached.**

**THESE ARE EXAMPLES ONLY AND ARE NOT TO BE CONSIDERED AS A TRUE GUIDE.**

### ALPACA MEASUREMENT DETAILS

ANIMAL NAME \_\_\_\_\_

NO \_\_\_\_\_

AGE \_\_\_\_\_

Date of Shearing \_\_\_\_\_

COLOUR \_\_\_\_\_

MICRON \_\_\_\_\_ SD \_\_\_\_\_ COV \_\_\_\_\_

YIELD \_\_\_\_\_

FLEECE WEIGHT

SADDLE \_\_\_\_\_ NECK \_\_\_\_\_

MIDDLE LEG \_\_\_\_\_ BALANCE \_\_\_\_\_

TOTAL \_\_\_\_\_

LENGTH

APPARENT \_\_\_\_\_ TRUE \_\_\_\_\_

%VARIANCE \_\_\_\_\_

CRIMP RATING \_\_\_\_\_

FIBRE CURVATURE \_\_\_\_\_

TENSILE STRENGTH

N/KT \_\_\_\_\_ OR SOUND \_\_\_ TENDER \_\_\_

COMMENTS \_\_\_\_\_

\_\_\_\_\_

MEDULLATION \_\_\_\_\_

PRICKLE FACTOR \_\_\_\_\_

(Number of fibres over 30 microns)

FLEECE CODE \_\_\_\_\_

COMMENTS

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**EXAMPLE ONLY**

selindex alp

**SELECTION INDEX WEIGHTING**

	<b>CULL LEVEL 10</b>	<b>INDEX WEIGHTING</b>
CONFORMATION	7	3
FINENESS	7	4
DENSITY	7	3
FLEECE WEIGHT	6	2
LENGTH	6	1
CRIMP	6	2
LUSTRE/SHEEN	6	2
MEDULLATION	6	3

ANIMAL NO	CONF	FINE	DENS	FLWT	LTH	CRMP	LSTR	MED
1	5	9	8	8	4	6	6	9
2	8	7	6	8	9	7	7	6
3	9	9	9	9	9	5	8	7
4	10	7	7	7	7	7	5	7
5	9	9	7	8	6	9	8	9

**EXAMPLE**

NO 1

CONF 5X3    FINE 9X4    DENS 8X3    FLWT 8X2    LTH 4X1  
 =    15            36            24            16            4

CRMP 6X2    LSTR 6X2    MED 9X3  
 =    12            12            27

TOTAL = 146  
 200

INDEX = 73

*\* EXAMPLE ONLY*

## ALPACA HUACAYA SELECTION WEIGHTED SCORE CARD (75/25)

**ANIMAL NUMBER** \_\_\_\_\_ **YEAR** \_\_\_\_\_ **AGE** \_\_\_\_\_

**FLEECE**

	EXCL	GOOD	AVER	POOR	V.WK	TOT
FINENESS/HANDLE	10	8	6	3	0	
C of V	10	8	6	3	0	
EVENNESS OF FLEECE	5	4	3	1.5	0	
DENSITY	10	8	6	3	0	
LOCK STRUCTURE/TYPE	5	4	3	1.5	0	
UNIFORMITY OF COVER	5	4	3	1.5	0	
DEFINITION OF CRIMP	5	4	3	1.5	0	
BRIGHTNESS (SHEEN / LUSTRE)	5	4	3	1.5	0	
FREEDOM FROM GUARD HAIR	10	8	6	3	0	
FLEECE WEIGHT	10	8	6	3	0	

**ANIMAL CONFORMATION**

	EXCL	GOOD	AVER	POOR	V.WK	TOT
HEAD      JAW Y/N      MUZZLE EARS Y/N      BONNET/HEAD SHP	3	2	1	.5	0	
	3	2	1	.5	0	
LEGS      FRONT REAR GAIT	4	3	2	1	X	
	4	3	2	1	X	
	2	1	0	0	X	
BODY      SIZE /CONDITION / BONE NECK / TOPLINE / BARREL PROPORTION / BALANCE	3	2	1	.5	0	
	4	3	2	1	0	
	2	1.5	1	.5	0	

TOTAL SCORE \_\_\_\_\_

COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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**EXAMPLE ONLY**

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Breeder and Judge U.S.A.

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The following for their generous use of their photos,

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J Armstrong  
Clark, N & R& A.  
Preuss, A.

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## **AUTHOR - CAMERON HOLT**



**Cameron, who has had some 40 years in the fibre industry as a wool broker, judge, educator and also in his semi retirement continues with alpaca research. He is currently judging for the Australian Alpaca Association and in his role as Senior Fleece Judge and trainer for AOBA, has been involved in the training of their judges as well as judging. Cameron, a leading alpaca fibre expert, continues his educational clinics and lectures throughout the world.**