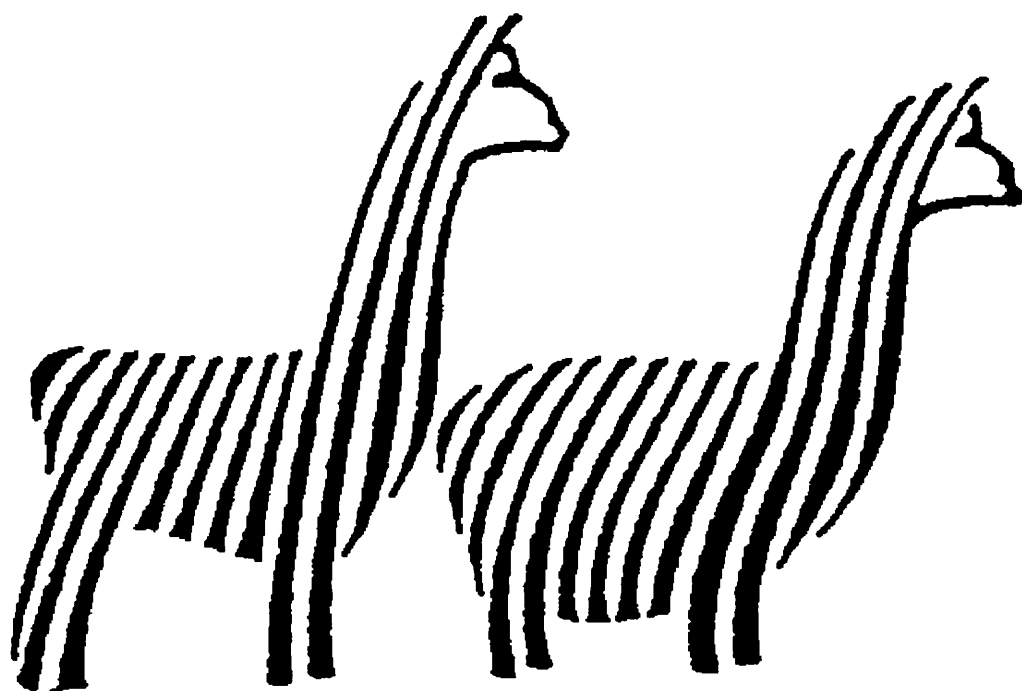


**NEW ZEALAND**  
**ALPACA FIBRE MANUAL**



# NZ ALPACA FIBRE MANUAL

## CONTENTS

Purpose and Aims	1
Alpaca Fibre Characteristics	2
Preparation for Shearing	3
Paddock Preparation	3
Animal Preparation in the yards, including cria	4
Fleece Preparation in the yards	5
Preparing the shed for shearing	6
Requirements for fibre sorting	7
Alpaca Shearing Goals	8
Fleece sections on an alpaca	8
Alpaca Shearing	9
Mid side sample	10
Fleece histograms	10
Skirting Alpaca Fleece	11
Sorting the fibre	12
Classing of Alpaca Fibre	13
Storage of fibre	15
Adding Value to your Fleece	16
Commercial Processing	17
Fibre Content and Care Labelling	18
Glossary of Terms	20

The manual has been distributed by the Alpaca and Llama Association of New Zealand (ALANZ) to members, for their benefit. It is also available for non-members to buy.

# NZ ALPACA FIBRE MANUAL

## Purpose And Aims

This alpaca fibre manual has been written to provide essential information for fibre management and marketing for New Zealand conditions. The guidelines given in this manual are non compulsory and self regulatory and it is anticipated that these will be implemented and maintained through fibre workshops and publications. The manual aims to assist in:

### **Fibre Management**

- ◆ To identify differing superior fibre properties and characteristics.
- ◆ To monitor trends in the development of the fibre on your farm.
- ◆ To provide objective results to facilitate informed decisions and comparison (eg purchase, sale, or breeding decisions and stud selection).

### **Fibre Marketing**

- ◆ To prepare and present fibre so as to maximise returns.
- ◆ To provide recognised standards with classed parcels of fibre exhibiting the same qualities.
- ◆ To foster consumer confidence to develop and expand alpaca fibre sales.
- ◆ To provide a means of matching buyers and sellers of fibre.
- ◆ To identify and allow a premium to be sought, and paid, for superior or speciality fibre.

This NZ alpaca fibre manual is compatible with similar manuals and systems operated by

- Alpaca Fibre Co-operative of North America Inc.
- Alpaca Fibre Co-operative Ltd. Australia
- Australian Fibre Marketing Organisation Ltd.

It has been prepared by Brian Kitson of The Alpaca Centre and Linda Blake of Alpaca Services in consultation with Cameron Holt, Australian Consultant for Alpaca and Speciality Fibres.

The authors have prepared the manual using current knowledge and known best practice. Care has been taken to ensure the accuracy and efficacy of the manual. However the authors accept no responsibility for any actions or inactions, results or consequences, foreseen or unforeseen, that may arise from use of this manual by any person.

The manual's format allows alteration and update of individual pages as information changes.

The authors welcome feedback, direct to them, aimed at improving this publication.  
Brian Kitson of The Alpaca Centre Geraldine phone 0800 4 ALPACA (0800 4 257 222)  
Linda Blake of Alpaca Services RD 1 Christchurch phone 0800 ALPACA (0800 257 222)

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# NZ ALPACA FIBRE MANUAL

## Alpaca Fibre Characteristics

Different fibre characteristics provide different processing results. Thus it is essential to recognise those traits that are important to the processor. Similarly comparison of these traits over a period of time will provide trends that will reflect nutrition, animal health and your breeding programme. Important fibre characteristics are:

- 1) **Uniformity of fibre type** is determined by breed classification (i.e. Huacaya, Suri) and genetics of breeding.
- 2) **Fibre Colour** is determined by breeding/genetics.
- 3) **Fibre Fineness** is primarily determined by genetics but also greatly influenced by age, nutrition, illness, stress etc.
- 4) **Length of Fibre** is determined by genetics, nutrition, period of growth, husbandry and environmental factors such as climate.
- 5) **Medullation** is primarily determined by genetics.
- 6) **Crimp** will differ according to breed i.e. Suri, Huacaya but is also determined by genetics.
- 7) **Tensile Strength** is determined by genetics, nutrition and animal health.  
Note: A consistent nutrition programme for the alpaca over the fibre growing period will ensure uniformity of fibre growth and diameter and thus avoid break points.
- 8) **Yield** is determined by genetics and animal size and is influenced by age, fineness, density, staple length and uniformity, as well as pasture management, skirting, period of growth and climate. The yield is the amount of clean dry fibre that remains after a given weight of raw fleece has been washed and any vegetable matter removed.

### Using staple/lock formation to evaluate fleece characteristics

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

Factors that influence the structure start with the genetic background of the animal. In New Zealand traditionally our alpacas have lacked both crimp and density and in general would have a high relationship of primary to secondary hair follicles. The primary follicles tend to be larger, medullated, and grow faster than the smaller secondary follicles.

Where there is uniformity in the follicle size the fibres tend to grow to a similar length with the tips being even or "blocky". When you observe tips that are "spikey" this is an indication of uneven growth caused from a high incidence of primary to secondary fibres. The higher the incidence of long spikey tips the greater the probability of heavy medullation.

A recent joint research project between The University of Sydney-Orange Agricultural College and the Australian Alpaca Association sets out a fleece scoring table. Two new concepts, **deep and bold crimp** and **fibre bundles**, are being used as "typical biological indicators of the quality of an advanced fleece and the genetic merit of the animal for fleece production".

# NZ ALPACA FIBRE MANUAL

## Preparation for Shearing

The preparation of the alpaca fibre for sale is the *culmination of the year's work*. The shorn fibre will reflect the total environment experienced throughout the growing period.

Environmental conditions, stress and reproductive schedules should be taken into account before deciding when to shear. It is not considered advisable to shear pregnant alpacas in the first and last 60 days of pregnancy. Care should also be taken in transport at this time.

It is desirable to shear annually, both for useable fleece and for alpaca health. Shearing yearly in late spring gives an alpaca time to grow an adequate fleece for winter and reduces overheating in summer. Shearing before seed set also reduces the amount of seed available to contaminate the fibre.

Newly shorn alpacas should have shade/shelter available, as sunburn can be a problem, especially for white alpacas.

Prior to shearing it is important to prepare both the animals and the shearing shed to reduce handling stress, minimise fibre contamination, and complete shearing efficiently.

## Paddock Preparation

The production of clean alpaca fibre begins in the paddock weeks before shearing day.

Keep alpacas on clean pastures. Keep alpacas out of areas which have vegetation which may stick to and contaminate the fibre e.g. thistles, burrs, bidibids, gorse, and away from seeds like barley grass, storksbill, sticky pittosporum. Avoid shelter trees which drop fine debris e.g. some conifers, silver birch, and the sticky catkins of poplars before the leaves appear.

Remove alpacas from paddocks which have ponds, river banks, muddy and dirty roll patches several weeks prior to shearing. Mud contaminates the fleece, although it can be washed out.

Rake up twigs, dry vegetation, loose grass and hay. If topping paddocks, do this several weeks prior to ensure all loose grass has gone prior to shearing. If burning this vegetation, remove ashes from the paddock.

The use of hay racks with solid catchers underneath will do a lot to reduce contamination. Ensure all twine from hay bales is removed from paddocks.

If transporting alpacas prior to shearing, make sure the float is clean. (Many commercial firms use sawdust and wood shavings in the bottom of floats, which contaminates the fibre.)

A good shower of rain several days prior to shearing will help clean alpacas, but it is preferable for the alpacas to be shorn dry. Shearing later in the day allows damp alpacas to dry out.

In drizzly weather consider keeping the alpacas in shelter overnight – in shelter sheds or covered yards. Consider the room they have to dung and to sit, as dung sticks to the fibre.

# NZ ALPACA FIBRE MANUAL

## Animal Preparation in the Yards

Separate adult male alpacas from the females. If necessary, keep males separate from each other to avoid fighting. Calm alpacas are easier to shear.

Sort alpacas by colour and pen separately. Shear in colour batches, from light to dark, and remember to sweep down thoroughly at each colour change to avoid colour contamination. Suggested sequence is:

- Whites
- Light fawns (include fawn/white multis)
- Fawns
- Browns
- Rose greys (include brown/white multis)
- Silver greys (include black/white multis)
- Blacks

Immediately prior to shearing each pen of alpacas, let them out to a holding paddock with a dung heap. They will "go" here, reducing the risk of contaminating the shearing area with dung and urine.

Once an alpaca is shorn, move it into a separate area, away from the fleeced animals, and preferably out of sight. Shorn alpacas need to recognise each other again, and until they do, they may spit at each other.

## **Exceptions**

An exception to this colour separation could be to keep very young, nursing, cria with their mum, regardless of colour differences.

Having calm animals around during shearing, can calm down an alpaca being shorn.

Some alpacas are dirty at shearing, with urination, dung, and spitting. To minimise contamination, do these animals last.

## Preparation of Cria for Shearing

For young animals, being shorn for the first time, remember this is a new experience for them. From this introduction, they learn ways of behaviour which continues at annual shearing. Let a young cria see a placid alpaca shorn first, if possible.

A cria fleece, with its added length and fineness, has the ability to command a higher price. It can also be a difficult fleece to clean, as the curly cria tips on the end of the fibre catch things.

"Tipping" of the cria fleece at 3 months of age reduces vegetation caught up and improves the cleanliness of the fleece. The tipping, done with hand shears, takes 1 cm off the tips, removing the curly end, on the blanket fleece. Done well, the tipped fleece looks similar to the untipped fleece, so it is hardly noticeable.

# NZ ALPACA FIBRE MANUAL

## Fleece Preparation in the Yards

It is far easier to clean an alpaca's fleece on the alpaca, than when it has been shorn off. Effort spent here, although time-consuming, saves time spent cleaning fleece later, and can transform fleece from almost valueless to being saleable.

Each alpaca should be individually handled and the fleece prepared for shearing. A small pen or yard or narrow chute to contain the animal is needed. The more your alpacas are used to handling, the easier this will be.

**Hand pick** off any large pieces of hay etc on the fleece. Further cleaning requires the use of some or all of the following tools:

**Scissors** may be needed to cut out thistles, burrs and badly contaminated fleece.

**Brush** A Tteam training (or similar) brush will detach small vegetation on the main body of the animal. Use the brush with a flick of the wrist, flicking back and forth across the fibre. Do not brush into the staple as this tends to damage the lock structure and the tip of the fibre.

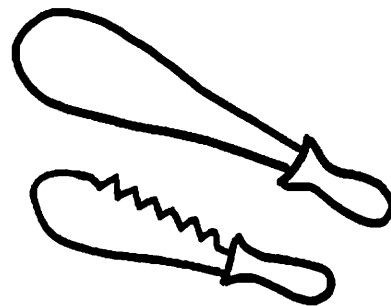
A **mechanical blower** (leaf blower, reverse of vacuum cleaner) will remove dust, vegetation and mineral matter from the fibre. It is preferable to have got the alpacas used to the blower before shearing. Do this in small steps – initially having the blower near them so they know the noise, then letting them feel the wind it makes, before actually using the blower on the animal's fleece.

A **vacuum cleaner**, used with the suck function, can suck loose debris and dust from the alpaca fleece. The same comments above apply, to get the alpaca used to this before shearing. (Note: Fibre classers do not recommend using a suck function on the fleece.)

**Metal wands**, shaped as below, can be used on dry fibre on the alpaca's body. These work on the small particles being attracted to the wands by the electrostatic fields they create.

The crimped tool is used first, with a chopping motion, which creates an electrostatic field. The debris bounces to the surface then falls to the ground as the process continues.

Once this surface grooming has been done, the looped tool is used to lift the fleece, allowing access to the deeper undercoat for cleaning, either with this tool or the crimped one.



# NZ ALPACA FIBRE MANUAL

## Preparing the shed for shearing

The term shearing shed includes the outside yards, the inside pens, a shearing area, a fibre preparation area and the fibre storage area. Here's a checklist for the shearing requirements.

- ❑ A shearing surface is the first thing to choose, as this will determine where you shear. A smooth painted/varnished wooden surface with suitable animal restrainers or a shearing table is preferred. If you have a concrete floor, you can place plywood, chipboard or MDF sheets, a tarpaulin or canvas sheet on top of the concrete. Do not use a polypropylene tarpaulin as the fibre will stick to it. Avoid shearing on grass, gravel or dirt areas to reduce contaminating your fleece.
- ❑ Check for contamination. Remove polypropylene twine and bags, bottles, cans and any other loose objects. Remove hay, dust, fluff, gravel and animal feed like nuts etc. Remove any cigarette butts and this should be a non smoking area for shearing.
- ❑ Remove any other animal fibre as well as toenail or teeth trimming remnants. Ideally neither of these things should be done at shearing as the bits can get in the fibre. Practically speaking, this is an easy time to do these tasks, and use of a shearing table allows this to occur without such a high likelihood of contaminating the fibre.
- ❑ Remove any protruding objects likely to cause injury to alpacas or humans.
- ❑ Ensure that there is adequate ventilation to allow air movement but avoid strong draughts which could spread fibre.
- ❑ Ensure adequate lighting especially where the fibre preparation is to take place. Five foot fluorescent wool lights are recommended for this area. Code no. is TLD 5896
- ❑ Check that the Occupational Health and Safety requirements are known and met. Make sure Work Injury Insurance details are displayed especially if employing casual staff.
- ❑ Arrange personnel - several alpaca handlers and one or two people to complete the fibre classing, sorting, and record keeping.
- ❑ Arrange the shearer and check the shearer provides own handpiece, combs etc. If you provide the shearing handpiece make sure it is in good going order. This piece of equipment is probably responsible for most shearing shed delays. Use a transformer or isolating plug for safety if shearing outdoors.
- ❑ Provide a supply of vegetable oil or something like "Proma" to lubricate the handpiece.
- ❑ First Aid Kit (meeting Factories and Commercial Premises (First Aid) Regulations 1988) You can use "Betadine" cream for any small cuts to the alpacas as well as for people.
- ❑ Have brooms and vacuum cleaner for cleaning fibre off the shearing surface and a hand shovel, bucket of water and a good supply of rags to clean up spit/urine/dung.
- ❑ Provide rubbish bins to contain rubbish generated during shearing.

# NZ ALPACA FIBRE MANUAL

## Requirements for fibre sorting.

Here's another handy checklist, for initial handling of the fibre.  
(See later for more details of skirting and classing and storage of fibre).

- Skirting/sorting table. A plastic mesh of 16mm or a wooden wool table is suitable, as second cuts and short pieces and fine vegetation and dirt will fall through the holes.
- ALANZ classification/colour wall chart.
- Record book, pens, marking pens, fleece bag tags and labels.
- Small clear ziplock plastic bags and rubber bands for midside fleece samples.
- Scales to weigh the fleece.
- A ruler to measure the fibre length. If it is attached to the sorting table, it will not end up in a fleece bag.
- Bags to collect fibre as it is shorn. (see suggestions below)
- Bags to store individual fleeces once classed. Clear plastic perforated bags allow you to see what coloured fleece is inside the bag. Multi wall paper bags are also O.K.
- Fibre bale containers and/or boxes to store fleece bags.

## Hints for fibre collection

Different parts of the alpaca's body produce different fibre, so it is desirable to shear and collect this fibre separately. This makes fibre sorting quicker and easier later.

Colour coding of the collection bags makes it easier to separate different areas by using:

- ❖ different coloured labels – colour coded by tag or coloured pen to match animal colour
- ❖ different coloured bags – black, brown, green, white and clear plastic bags are available
- ❖ different types of bags – plastic, multi-walled paper bags
- ❖ different sizes – e.g. large clear plastic for blanket, recycled supermarket bags for legs etc.

Weigh each bag, containing a different part of the fleece, and record weights as you go.  
Setting up a chart makes this easier for recording purposes. e.g.

Name/IAR	micron	blanket	neck	legs	other	total weight	% prime fleece	comments

If you use every second line, it is handy to enter the final cleaned weight underneath later.  
The comments can be about the fleece, or behaviour of the alpaca e.g. messy when shorn.

# NZ ALPACA FIBRE MANUAL

## Alpaca Shearing Goals

- ◆ Minimise stress on the alpaca. The shearing process/noise will put some stress on the animals. Care should be taken around the face and the lower leg where alpacas are extremely sensitive.
- ◆ Remove the fleece in an efficient manner that avoids damage to the alpaca/fleece/yourself.
- ◆ Develop a method of shearing the alpaca so as to provide parcels of fleece that are uniform in their properties and characteristics, with second cuts kept to a minimum.
- ◆ The alpaca should be left about 5-10mm of fibre as protection from sunburn/cold weather. This can be achieved by use of a snow comb, some form of lifter, or by blade shearing. A new alpaca comb, Lister 3, leaves some fibre on, and is now available in New Zealand.

## Alpaca fibre producers responsibilities.

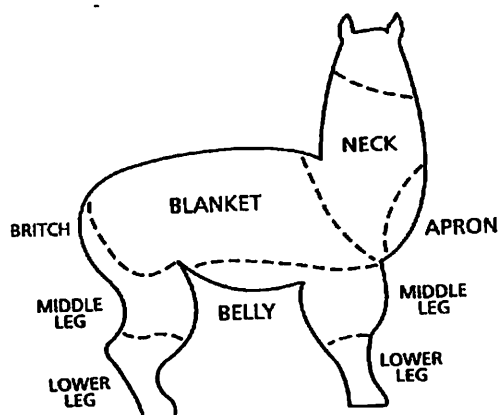
- ◆ To ensure the shearing shed is clean of all contaminants prior to shearing and that all equipment needed for shearing is in the shed.
- ◆ To provide adequate labour to enable safe collection and preparation of the fibre.
- ◆ To present the alpacas in a shearable condition.
- ◆ To provide a safe and healthy workplace.

## Alpaca fibre classer/sorters responsibilities.

- ◆ To ensure that stain, heavy vegetable matter and contamination are removed.
- ◆ To ensure that each alpaca fleece is correctly skirted, weighed and classified.
- ◆ To ensure no wet/damp fibre is packed in bags.

## Fleece sections on an alpaca

An alpaca fleece is usually shorn off in sections, to maximise the value of the fibre.



Areas to consider leaving on the alpaca:

- Some of the fibre on the tail to provide coverage over the sensitive skin around the genital area. Remove enough tail fibre so the tail does not interfere with mating.
- Some of the fibre on the head of the alpaca, to retain their individual character. If you do this you may need to trim long fibre around the eyes (with scissors) so they can see.
- Some people, particularly when blade shearing by hand, remove only the main blanket fleece, which allows shorter fleece to grow longer for an entire shear the next year.

# NZ ALPACA FIBRE MANUAL

## Alpaca Shearing

To produce saleable fibre it is essential that the fleece be removed in parcels that are uniform in their properties and characteristics. Alpacas can be shorn in either the standing position or lying down using leg restraints. It depends upon the shearer, the alpaca, and the owner.

Use your eye and the feel of the fibre to locate the boundary between sections. As each section is shorn, it should be collected to ensure the fibre is kept separated. Ideally the blanket is removed first, as this is the best part of the fleece and this minimises contamination by other parts of the fleece.

When shearing an alpaca standing, the sequence begins with the blanket. Gravity helps the fleece removal, so be ready to collect the different sections as they are shorn, in this order:

Blanket – Neck – Apron – Belly - Middle legs - Lower legs

When shearing an alpaca lying down, use leg restraints. This can be done on the floor with rope attachments to the walls, or by using an alpaca shearing table. (Note: The restraint is just that - do not apply undue force that will over stretch the alpaca.) An order suggested is:

Blanket - Middle legs - Neck - Apron – Belly - Lower legs

The reverse order is also used, but with more likelihood of contaminating the blanket, the best part of the fleece, with other cuts. In suri the middle leg may be shorn with the blanket.

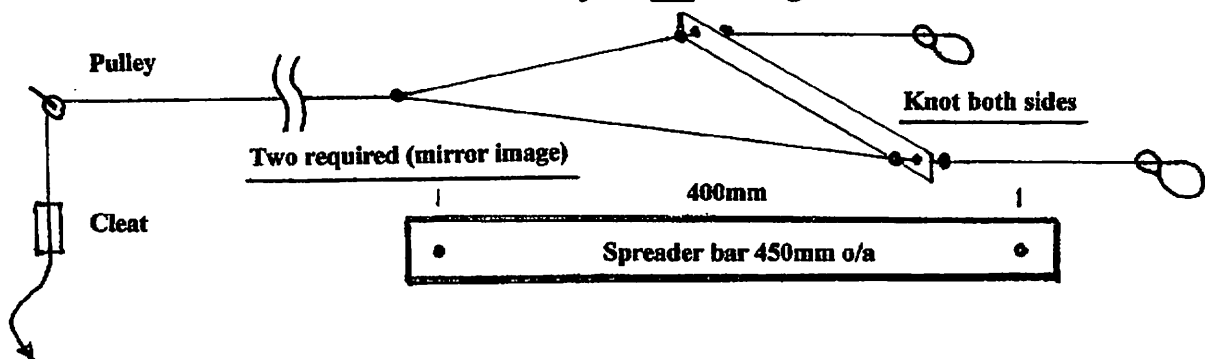
### Shearing Restraint:

Notes. Distance between locating points should be not less than 4m.

Height of locating points from floor around 400-600mm.

Use "soft" braid or similar, as ropes for restraints.

Remember this is a restraint only -do not over tighten.



# NZ ALPACA FIBRE MANUAL

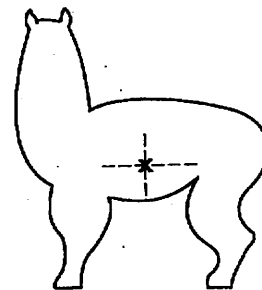
## Mid side sample

A mid-side sample represents the average micron of the fleece, which is used as a measure of fineness of the fleece. About 30 grams is necessary for a sample to be tested for micron. Fibre must be shorn at skin level, and taken from the midside to get a representative sample.

Just prior to shearing, or as the alpaca has been restrained, is a good time to set up to take a mid side sample. Take a rubber band and place it around the clump of fibres (around 50mm in diameter) in the position as marked out in the diagram below. Alternatively, gather the fibre from two blows, about 15cm long, of the shearing handpiece at this point.

Some shearers will take the midside sample first. Once the alpaca is shorn in this area, this clump of fibres can be retrieved. Place it in a small ziplock bag together with suitable identification. An example is given below.

Mid side Sample Date: / /  
 Breeder Name.....  
 Alpaca Id: Name/No..... IAR No .....  
 Breed: Huacaya/Suri  
 Age.....  
 Sex: male/female

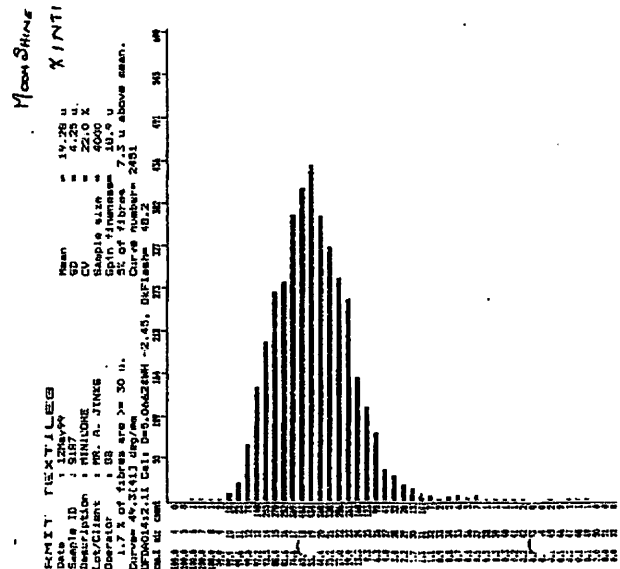


Samples may then be sent to a Fibre Testing House. The testing house will send you a histogram of the fleece sample, with common measures detailed. This information can be transferred to the fleece bag tag recording details of each individual fleece. It is a valuable input into your management evaluation system.

Fibre distribution in a fleece should occur in a bell-shaped normal curve (good example below) with the majority of the fibre within two standard deviations each side of the mean or average.

Common measures taken of alpaca fleece are:  
 mean micron –  $\mu$  – the lower the better  
 coefficient of variation – the lower the cv,  
 the more consistent the fibre  
 standard deviation – the smaller the better  
 % of fibres over 30 micron – fewer the better  
 spinning fineness

Here's what this histogram (a good one) says:  
 Alpaca S187 Benleigh Moonshine (sire Purrembete Inti)  
 Sampled 12 May 1999 (at 18 months old)  
 Mean micron 19.28  $\mu$  CV 22% SD 4.25  $\mu$   
 % fibres over 30  $\mu$  1.7% spin fineness 18.9  $\mu$   
 Tested by Melbourne Institute of Textiles



Three testing houses regularly testing alpaca fleeces in New Zealand are:

SGS Wool Testing Services Ltd  
 P O Box 349  
 Timaru

Wharepuna Fibre Testing Ltd  
 P O Box 32  
 Kirwee, Canterbury

WRONZ  
 Private Bag 4749  
 Christchurch

# NZ ALPACA FIBRE MANUAL

## Skirting Alpaca Fleece

Once the fleece is shorn it should be placed on a sorting table made of slats or mesh. Rubbing, bouncing, or “shaking” the fleece will allow dust, small particles and short ends to fall out and through the table to the floor/ground underneath.

Check for excessive variation.

Remove coarse fibres, especially britch fibre from the rear/tail.

Remove heavy medullation (hairy fibre). Check for this on the apron at the base of the neck, and in the belly fibre from underneath the alpaca.

Remove stains. Check around the britch for urine and dung staining and remove. Check the leg fibre for water and mud stains – which can be washed out.

Remove areas of fleece contaminated with excessive vegetation matter, before it spreads into other areas of the fleece. Check along the centre of the back, and at the base of the neck where it meets the back for the “birds nest” that collects here. Skirt it out and throw it out.

Remove “second cuts” and short fibres, if under 40mm. Check the lower leg fibre for these.

Remove overlong fleeces and sort separately.

You will have to pick over the fleece to thoroughly clean it, and may need to pull the fleece apart to achieve this.

**If in doubt, throw it out !**

## Fleeces with more than one colour

The minority colour can be removed and skirted to one side. This is relatively easy for white socks, white head markings, as it can be easily separated as you shear and collect these parts of the fleece in sections.

Multi-coloured, saddled animals are more difficult, as there is a greater area where the colours meet. At this meeting of the colours it is very difficult to separate so each colour is not contaminated by the other.

A consideration is to blend together these colours – either as fleece, or the areas in common, providing a variegated fleece for the craft market or a speckled yarn.

## Overlong Fleeces

It is desirable to shear annually, when the staple is about 75-100mm long. Huacaya fleeces over 150mm long have limited usage. Commercial processors find that the longer fleeces wrap around the carding machine, and commercial spinners are used to spinning short sheep fibre. Some crafts people use the longer fibre, and there are speciality uses for longer fibre.

# NZ ALPACA FIBRE MANUAL

## Sorting the fibre

The aim of fibre preparation is to produce parcels of fleece which are uniform in their characteristics and properties. Alpaca is a quality fibre and it is essential that alpaca fleece is presented so as to encourage its use.

This is best achieved either during shearing or by grading the total fleece on the fleece preparation (sorting) table. In practice it is a little of both, the fleece is sorted during shearing and then it is tidied up on the table.

Although alpaca fleece can be shorn and collected in 6 different categories, some of these can be amalgamated into 3-4 categories when the fibre is sorted for storage and sale. Some examples of amalgamation, depending upon the quality of your fleece, are given below.

The general properties of the fibre from each of the areas are as follows:

**Blanket (saddle)** - Normally regarded as the best quality fibre, being finer and uniform in length. It represents 60% of the total fleece but can vary from 50% - 80% depending on the overall evenness of the fleece.

**Neck** - The fleece on the neck is usually similar to that on the blanket but shorter in length, which means it is required to be separated. Improving genetics are quickly reflecting an improvement in the characteristics of the fibre in the neck and middle leg sections and in these cases the fibre can be graded with the blanket. If there is a high degree of medullation perhaps it should be downgraded to be included with the apron and belly.

**Middle leg** - Generally stronger in micron compared with the blanket. This area again can vary greatly from alpaca to alpaca. With the absence of strong fibre or medullation as with improved fleeces mentioned above, this area may be sorted with the blanket. If it is strong, especially around the britch area, it is best downgraded with the apron.

**Apron** - This is typically highly medullated coarse fibre and is normally sorted with the belly. The size of the apron can vary considerably from alpaca to alpaca.

**Belly** - Is normally coarse and is put with apron.

**Lower leg** - Normally coarse, mostly short, and hair-like fibre.

Depending upon the quality of your fleece, you may wish to amalgamate some categories. e.g.

	Poor	Average	Good
<b>Blanket/Saddle</b>	✓	✓	✓
<b>Neck</b>	✓	✓	Incl. with blanket
<b>Middle Leg</b>	Can be combined	✓	Incl with blanket
<b>Apron</b>	Can be combined	Can be combined	✓
<b>Belly</b>	Can be combined	Can be combined	✓
<b>Lower Leg</b>	Can be combined	Can be combined	✓

# NZ ALPACA FIBRE MANUAL

## Classing of Alpaca Fibre

Following the fibre preparation/sorting carried out in the shearing shed the blanket and best fibre areas should now be able to be graded and segregated as follows:

- (1) Fibre type
- (2) Colour
- (3) Fineness
- (4) Length
- (5) Medullation
- (6) Crimp/style

An easy to read chart is provided as a ready reference.

### (1) Fibre Type

Huacaya or Suri.

### (2) Colour

The fibre can be classified into five main colours, White, Fawn, Brown, Grey and Black.

These are amalgamated colours from the range of the AAA Natural Colour chart, used to determine colours.

Note as volume increases or there is a demand for special colours the colours may be expanded or a buyer may select a specific colour from the AAA natural colour chart.

### (3) Fineness

It is felt that at this stage although we probably only need three classifications of fineness, we have gone for more categories, as it is easier to combine categories, than try to separate later.

For huacaya, six categories have been chosen as this provides a lot more flexibility, and for suri, five categories will be adequate until the volume of fleece produced warrants further classification.

These categories (given overleaf) can be mixed e.g.

If one was going to produce some fine textiles one may use both ultrafine and superfine mixed. If one was going to make some 4 ply machine knitting yarn you would probably use superfine and fine mixed.

Colour Categories	AAA Natural Colour Chart
1. White (W)	White
2. Fawn (F)	Light Fawn Medium Fawn Dark Fawn
3. Brown (BR)	Light Brown Medium Brown Dark Brown
4. Grey (G)*	Light Grey Medium Grey Dark Grey Rose Grey Multi
5. Black (B)	Black
*White with black fibres and black with white fibres will be added to Grey.	

# NZ ALPACA FIBRE MANUAL

<b>Huacaya</b>	Less than 20 microns	HUF	Ultrafine
	20----22.9 microns	HSF	Superfine
	23----26.9 microns	HF	Fine
	27----30.9 microns	HM	Medium
	31----35.9 microns	HS	Strong
	36 and stronger	HC	Coarse
<b>Suri</b>	Less than 21 microns	SSF	Superfine
	21----25.9 microns	SF	Fine
	26----30.9 microns	SM	Medium
	31----35.9 microns	SS	Strong
	36 and stronger	SC	Coarse

## (4) Length

**Huacaya** The length of the fibre determines the process used in manufacturing.

Over 150 mm	OL	Overlong
101----150 mm	L	Long
75----100 mm	M	Medium
50---- 74 mm	S	Short
under 50 mm	VS	Very Short

**Suri** This fibre, by nature, will be processed by the worsted process.

Over 225 mm	OL	Overlong
151----225 mm	L	Long
85----150 mm	M	Medium
50---- 84 mm	S	Short

**Note:** There is a market for clean overlong fibre through the craft market.

## (5) Medullation

It is not considered feasible to grade for medullation as we only have very small volumes and this grading is subjective, not an objective standard. All heavy medullation should have been removed from the fibre during sorting on the fibre preparation table.

To provide you with a guide for your own fleece evaluation records you can check to see how much guard hair is present by holding the tip of a lock of fibre firmly in the thumb and forefinger of one hand and the butt end loosely held in the thumb and forefinger of the other hand. By gently pulling your hands apart the straight medullated fibres will be removed. You can also open up the staple against a contrasting background to ascertain the incidence of straight medullated fibres.

## (6) Crimp / Style

**Style 1** Fleece that shows a good wool like crimp along the length of the staple.

**Style 2** The crimp is not well defined along the length of the staple but there is crinkle within the individual fibres.

**Style 3** Fibre that has no wave formation in the staple or crinkle in the individual fibres.

# NZ ALPACA FIBRE MANUAL

## Storage of fibre

Alpaca needs to “breathe”, so it is preferable to use natural fibres to store it in. Preferably use paper bags or cellophane bags, or perforated plastic bags. Do not seal the tops of plastic bags.

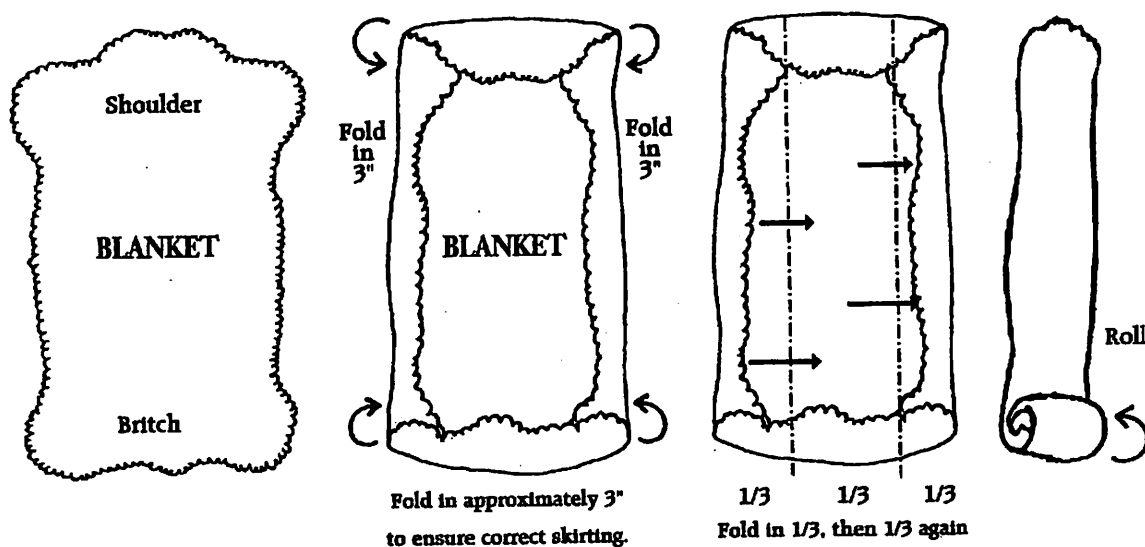
Clear cellophane or plastic has the advantage that you can see what coloured fleece is inside.

No matter whether you use plastic or paper bags the fibre should be “dry” before it is placed in the bags. Note that “dry” fibre contains around 150grams of water per kilogram of fibre. If the fibre is left in direct sunlight it will sweat. It is best left in a light dry airy room away from direct sunlight.

Care must be taken to avoid moth infestation. Moth balls are not recommended, however a few sprigs of dried lavender or similar deterrent should help.

Once the fleece has been skirted the remaining blanket (saddle) should be folded and rolled into a bundle and placed in bag with suitable identification. An example of folding is as follows:

Three fold



Two fold is also used, when the blanket is rolled as soon as its edges have been folded in. You may also have your blanket shorn in two halves. Fold in the outer edge of each and roll.

Blanket fleece classed as of the same type - colour, micron and length - can be put together.

You may choose to prepare speciality lines. For instance grey fleeces lend themselves to being divided into light and dark, and the same classed fleeces can then be parcelled together into light grey and dark grey.

Similarly, multi-coloured fleeces and/or areas from multi-coloured fleeces where the two colours join, can be stored together. They provide interesting variations for hand crafters.

# NZ ALPACA FIBRE MANUAL

## Adding Value to your Fleece

Alpaca is a quality fibre and the colours and properties mean that there is an increasing interest in its use. It is essential that alpaca fleece is presented so as to encourage its use, and that any items produced are of good quality and reflect well on alpaca.

An increasing number of people are adding value to New Zealand produced alpaca fibre and yarn. This includes both machine spun, hand spun and felted items. The range includes hats, scarves, gloves, socks, jerseys, tunics, vests, cardigans, skirts, jackets and coats. As well as knitted garments, there are people venturing into woven fabrics, weaving of articles, duvets, wall hangings, accessories, and other uses. As these ventures expand and as new ones develop this will provide the market for those that just wish to sell their fibre.

There are a number of processes you can use to add value to your fibre.

**Cleaning** A fibre preparation table with 16mm mesh underneath will assist spreading out the fleece to clean. Start at one end and work your way through the fleece piece by piece removing all foreign matter. Follow the guidelines given for skirting.

**Washing and Drying** You may wish to wash a fleece because it is stained or to remove dirt and dust prior to carding.

Add the fibre to a tub of hot water and detergent. Using a porous bag will contain the fibre. It is preferable to use a liquid detergent rather than soap. (Try the dish washing liquid.) Hard water should be "softened" with a water softener. Squeeze the bag gently a few times and leave to soak for up to one hour. It is O K to use the spin cycle of the washing machine to get rid of the bulk of the water. Rinse twice in water about the same temperature as the fleece.

**Note:** Avoid agitation of the fibre in the hot water when washing, as this can lead to felting. When rinsing, you are trying to avoid any temperature change. The original washing water will have cooled over time and spinning will also have reduced the temperature of the fibre.

Damp fibre can be spread out on a fibre table to dry in the sun. A top constructed on the same basis as the fibre table, to similar dimensions, will stop dry fibre blowing away in the wind.

**Carding** A thorough cleaning of the fleece prior to carding is strongly recommended. Sort the fleece again, to remove excessive medullation and all vegetable matter leaving a fleece that is uniform in style, colour and fineness. Whilst some vegetable matter will fall out during carding, most bits will be chopped up and spread throughout the fleece, making it useless.

For large volumes it is recommended that you use the services of a local carder. Most will wash/card fibre for around \$15.00 per kg. A sliver, a continuous uniform strand of fibre, comes off a carder. Some can also produce a top - a continuous untwisted strand of combed fibre from which the shorter fibres have been removed

Using a small hand drum carder is suitable to process very small amounts of fibre. It is also useful for blending in other fibres or other colours when some degree of control and manipulation are necessary.

# NZ ALPACA FIBRE MANUAL

**Blending** Alpaca can be blended with most fibres i.e. cotton, silk, acrylics, wool etc. Blending can be done by a hand carder or a commercial carder, and the mix ranges from, for example, 20% wool:80% alpaca to 80% wool:20% alpaca. Be aware that the resultant blend will contain part of the properties of each fibre, so it is possible to introduce undesirable traits eg. pilling.

Hand crafters often blend by plying together a spun length of alpaca with another spun fibre. A common mix by this method is 50:50.

**Felting** The cuticle structure of the fibre stem differs from that of sheep's wool. Alpaca fibre is smoother and thus a little more difficult to felt. A blend of 80% alpaca:20% wool seems to be about the right mix. Rustic styled felted goods are a good use for the shorter/coarser fibres.

**Dyeing** Alpaca takes dye well, but remember that medulated fibre does not take up the dye to the same degree and thus becomes more obvious, especially with darker colours.

## Commercial Processing

Farming alpacas is relatively new in New Zealand, so there is very little in the way of specialised processing facilities at present. Alpaca fibre can be processed through our existing woollen mills by either the "worsted" or "woollen" systems. Their systems are mainly set up for high volume, clean, white, sheep's wool (which is shorter than most alpaca fleece.). Most suggest a minimum of 150kg if they are going to put a coloured lot through the system. There are smaller processing mills in New Zealand that will have smaller minimums and will probably be more suited to processing our alpaca fibre.

**Cleaning** Processing systems in general, the woollen system in particular, do not have a means of removing all the vegetable matter that an alpaca fleece can collect as the animal rolls. If we don't want to hand clean all fleeces then we need to develop a mechanical cleaner so that clean fleeces can be provided to the processor.

Alpaca fleece does not necessarily need to be washed/scoured to be processed into yarn. The fleece is usually carded, and may be combed, and a roving – a slightly twisted sliver - is produced during processing before the fibre is further drawn and spun into yarn.

**Woollen Process** Woollen spun yarn is normally thicker, fuzzy and bulky. The fibres are not aligned during manufacture so the garments made from this yarn are usually warmer. The woollen process can use shorter fibres or fibres that are not even in length. One of the main uses of this system would be knitting yarn.

**Worsted Process** A worsted spun yarn is more likely to be finer, smoother and less bulky as the fibres are all aligned during an additional combing process. The yarn is made from a staple exceeding 75mm and is stronger than woollen spun yarn. Worsted yarn is used in lightweight textiles and fine knitwear. The worsted process enhances alpaca fibre's lustre and drape.

# NZ ALPACA FIBRE MANUAL

## Fibre Content and Care Labelling

The Consumer Institute Standards Regulations 1992 came into effect on 1 September 1992 and under the Fair Trading Act we have to comply with both the Fibre Content Labelling and Care Labelling Regulations. Here are the relevant requirements if you are selling your fibre, yarn or camelid articles.

### Fibre

The Fibre Content Labelling Standard applies to all textile goods. The Commerce Commission advises that camelid fibre sold in processed form, eg washed and carded, should abide by these same regulations.

Fibre content needs to be listed on labels by their generic name, listed from largest to smallest. If a percentage is given, this precedes the generic name. e.g.

incorrect	30% alpaca	correct	45% wool
	25% guanaco		30% alpaca
	45% wool		25% guanaco

This does not help camelid products, where a mix of camelid fibre may be in the majority, as above, and wool in the minority, yet as the wool content is the single largest fibre, it appears first on the label.

Textiles can only be described as "pure" or "all" if they contain:

- 95% or more by mass of one type of fibre
- 95% or more by mass of a mixture of not less than 80% by mass of wool and with the remainder made up of alpaca, camel, cashmere, guanaco, llama, mohair, vicuna, or yak.

Thus if a woollen garment has 20% alpaca in it, it can be called "all wool" or "pure wool". But a camelid garment has to have 95% camelid in it before it can be called "all camelid".

### Yarns

Yarns for consumer goods need to have their fibre content clearly stated on either:

- an adhesive label fixed to the inside of the cone or spool, or
- on a swing ticket, wrapper or band attached to the reel, ball or skein

A label packaged in with your hanks or balls of yarn is deemed to be meeting the spirit of the Standard by the Commerce Commission.

Care instructions for yarns and textiles supplied for further processing need to be provided by the supplier either:

- on a label to sew into the finished article
- on a ticket attached to each roll of material
- in a pamphlet attached to or supplied with the product

For commercial goods, the yarn label should be on the cone or spool.

# NZ ALPACA FIBRE MANUAL

## Garments

Most garments should be labelled at the top centre back of the garment or in the left side seam adjacent to the hem. As well as complying with all of the previously given requirements, clothing also requires country of origin labelling.

## Care Labelling

Consumers must be aware of the method and cost of caring for products when buying them. The long list of goods requiring care labelling includes clothing, household textiles, furnishings, bedding, skins, hides, and piece goods and yarns made from textiles.

The care label should cover general cleaning instructions (washing, drying, ironing and drycleaning care) and, where needed, warnings.

Symbols by themselves are not acceptable - words must be included in the care instructions.

The most appropriate care label for camelid products would be "Handwash, warm water, dry garments flat".

It is a good idea to also add "store flat" for garments.

## Labels

Labels have to be legible, in English, of medium width lettering not less than 1.5mm high.

Labels must be permanent and accessible to the customer.

If this is not possible, then another fibre content label must be on one of the following:

- a removable ticket or label attached to the product
- a pamphlet accompanying the product
- the wrapper or package the product is sold in

# NZ ALPACA FIBRE MANUAL

## Glossary of terms

**BLANKET/SADDLE** Prime fleece from shoulder, mid-section and rump (2 sides)

**BRITCH** Fibre from the rear/tail area of the alpaca.

**CLASSING** The grading and sorting of various qualities of fleece into a uniform group or line of fibre.

**CLIP** The sum total of fibre harvested in any one shearing season.

**CRIMP** The regular wave formation or corrugation found in locks of fibre.

**CRINKLE** The regular wave formation or corrugation found in individual fibres.

**CV** coefficient of variation - the lower the c.v., the more consistent the fibre.

**DENSITY** A measure of the amount of fleece on an alpaca.

**FINENESS** The diameter of natural fibres measured in microns.

**HISTOGRAM** A graph of distribution of fibres in a fleece. It should ideally be in a bell-shaped normal curve.

**MEDULLATION** Fibre that has a central core which is made up of air-filled cells. It has a harder feel and does not take dye well.

**MICRON** A measure of fineness of fibre.

**MIDSIDE** An area midway between the front and rear legs on the side of the alpaca.

**REMAINDER** Fibre classified as "remainder" is the lower leg, belly, britch and apron. It consists of coarse, often matted, medullated hair. Sometimes the only usable fibre in this category is the apron which can be combined with the middle leg fibre.

**ROVING** A slightly twisted sliver, produced during processing before the fibre is further drawn and spun into yarn.

**SD** standard deviation. A measure of the distribution of the fibre in a histogram. The majority of the fibre should be within two standard deviations each side of the mean.

**SECOND CUTS** Short fibre which is created during the shearing process if the shearer does not cut the fleece close enough to the alpaca's skin, and then takes another cut to clean up the alpaca before removing the first cut fleece.

**SKIRTING** The separation of lesser quality fibre and foreign material from the prime quality fibre.

## **NZ ALPACA FIBRE MANUAL**

**SLIVER** A continuous uniform strand of fibre which comes off a carder.

**SNOWCOMB** A shearing comb specifically designed to leave a small amount of fibre on the animal for protection from sun/wind/snow.

**STRONG** Thick, coarse fibre having a higher micron measurement.

**STYLE** The cumulative and overall aesthetic effect of fibre characteristics found in a fleece.

**TOP** A continuous untwisted strand of combed fibre from which the shorter fibres have been removed.

**UNIFORMITY** Consistency of characteristics within a fleece or collection of fibre, e.g. crimp, length of staple, colour, fineness, etc

**WOOLLEN** The woollen process can use shorter fibres or fibres that are not even in length. The fibres are not aligned during manufacture so the garments made from this yarn are usually warmer. Woollen spun yarn is normally thicker, fuzzy and bulky.

**WORSTED** A worsted spun yarn is more likely to be finer, smoother and less bulky as the fibres are all aligned during an additional combing process. The yarn is made from a staple exceeding 75mm and is stronger than woollen spun yarn. Worsted yarn is used in textiles and fine knitwear.

**YIELD** The quantity of clean, dry fibre which remains after a given weight of fibre has been washed or cleaned to remove all contaminants.