Australian Alpaca
ASSOCIATION

Guidelines for Shearing Shed Set-up and Fleece Preparation

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Introduction

These guidelines have been prepared by the Fibre Marketing Development Committee of the Australian Alpaca Association. They update and replace the "Shearing Shed & Pre-Classing Code of Practice 2012" written by Cameron Holt, whose contribution to the alpaca fibre industry in producing the original text, and many of the illustrations reproduced in this document is gratefully acknowledged. The aim is to provide guidance to the alpaca fleece grower on:
:

- pre-shearing planning and preparation
- shearing shed set-up
- sorting, skirting and packaging of fleece

These are the critical first stages in a quality assurance program which if followed rigorously will ensure the maximum financial return for fibre produced.

Following the packaging of skirted and sorted fleece, it will move to the next stage in the processing chain; this could be to a broker or classing house where fleece will be classed by a qualified alpaca classer under the auspices of the Australian Wool Exchange (AWEX), or it could be sold directly to a processor or sent for processing by the grower. Brokers/classing houses and other purchasers/mills will have their own detailed specifications about how fleece is sorted or packaged, but the guiding principles remain the same*:*

through following a Quality Assurance approach from pre-shearing to the time fleece leaves the farm, the grower will maximise their financial return and contribute to ensuring that Australian alpaca fibre has a reputation for excellence as a luxury fibre.

Pre-Shearing Planning and Preparation

The quality assurance of alpaca fleece starts well before shearing.

Fleece Attributes

Some of the desired attributes of high quality fleece for processing can be dictated by breeding decisions (genetics):

- Fibre type (huacaya or suri)
- Fineness (micron), uniformity of micron and handle
- Colour (including the absence of colour contamination)
- Minimal guard hair (coarse primary fibres)
- Style (depth of crimp and bundling in huacaya and lock style/independence in suri)
- Lustre and brightness
- Yield (density and extent of saddle area)

Other factors can be wholly or partly manipulated through changes to management practices:

- Length (genetics and nutrition contribute – but duration of fibre growth and timing of shearing can be used as a management tools)
- Contamination (reduction in contamination by vegetable matter can
- be achieved by timing shearing to occur before seed set on pasture plants; try to keep animals in clean paddocks, without access to fire pits or other very dusty areas, in the weeks leading up to shearing)
- Lustre can be negatively affected by dust and poor nutrition
- Tensile strength(health, nutrition and climate can all affect the strength of the fibre and help avoid fleece which breaks – “tender fleece”)

When to Shear?

The decision as to when shearing occurs should be a planned one, taking into consideration:

- Climate – when does the weather start to warm up in spring?
- Fleece length – check what your buyer/processor wants. Generally, fleece between 75-140mm in length will command the best prices.

For suri it is particularly important to ensure fleece does not grow to over-length (>140mm). Management tools to ensure correct fleece length could include changing birthing seasons, shearing earlier (weather permitting) or shearing cria separately once fleece is of suitable length)

- Minimizing vegetable contamination – consider when pasture plants set seed and shear before this occurs

Having considered all the above….

Plan your shearing date and book your shearer well in advance!

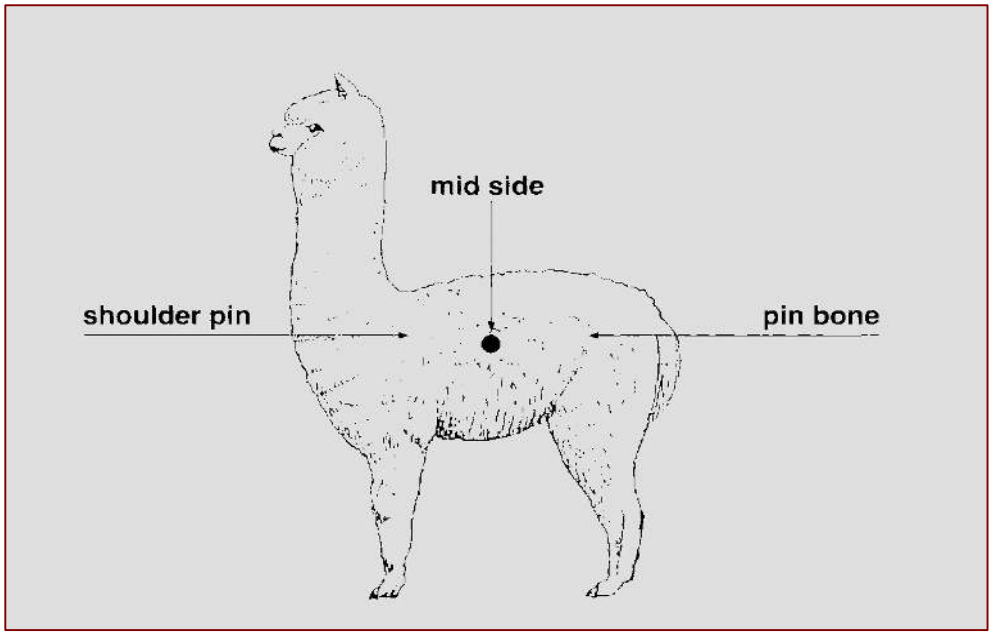
Mid-side sampling

The purpose of mid-side sampling is two-fold:

- Sampling provides an objective measurement of an animal's fleece qualities, which should be used to inform subsequent breeding/culling decisions. Tracking performance over a number of years will show which animals within the herd are performing the best.
- If taken *before* shearing, mid-side sample results can be used to assist in sorting the order in which your animals will be shorn (finest first), and in grouping shorn fleeces for packaging.

When taking mid-side samples, use sharp scissors (curved blades and a blunt tip are ideal) and take the sample as close as possible to the skin, from the mid-side point of the saddle (see diagram below); check with the testing lab how much they require as this could vary.
Identifying the mid- side point – equidistant between the shoulder and pin bones, and also between the backbone and belly – is critical to ensuring your sample is representative.

Note: this is a small sample from just one point on the animal – it will not tell you the uniformity of the fleece quality across the animal's body but is a reasonable indicator. More detailed results can be obtained by doing either a 3-point sample or a grid sample (see Appendix 1) but for most purposes a mid-side will suffice.



Place each sample in an individual bag (plastic or paper) and write on or label each bag with the animal's name or identifying number. There are several fleece testing labs providing alpaca fibre testing services.

Mid-side samples can also be taken during shearing (in consultation with your shearer) or (less accurately) from an already shorn fleece.

Appendix 2 explains how to interpret the mid-side test results.

Animal preparation

In the 24 hours leading up to shearing it is necessary to prepare the animals to ensure they are ready for shearing in the optimal condition:

- It may be necessary to yard or shed animals overnight before shearing, particularly if rain or heavy dew/fog are forecast – alpacas must be dry for shearing. Try to keep them on a surface that will prevent the fleece getting contaminated by sitting/rolling on a dirty floor.
- Avoid feeding chaff or loose hay for 24 hours, to reduce fleece contamination.
- Plan the shearing sequence and have animals sorted and penned accordingly. Shearing should commence with white animals, and progress through the colours from lighter to darker; this will reduce the risk of contaminating valuable white/light fawn fleece with darker

coloured fibres. Within each colour grouping, aim to shear the younger/finer animals first, to reduce the risk of contaminating fine fleeces with coarser fibres.

- Immediately before shearing some animals may need cleaning to remove vegetable matter or other contaminants, such as excess dust. This can be done with a piece of wooden dowel or a specially made wire wand for huacaya, or with a wavy-edged wire wand or horse grooming mitt for suri.
- DO NOT PLAN TO UNDERTAKE HUSBANDRY TASKS SUCH AS TOENAIL TRIMMING DURING SHEARING – IT WILL CAUSE CONTAMINATION OF FLEECES AND DETRACT FROM THE PRIMARY TASK – SHEARING!

Shearing Shed Set-Up

Whilst larger alpaca farms are likely to have a specific shed for shearing, some smaller/newer growers may be using less sophisticated infrastructure. The principles of set-up remain the same and can be divided between:

- Place
- People
- Equipment
- Facilities
- Lay-out
- Workplace Health & Safety

Place

A purpose-built shed in an accessible position on the property (ie. ease of getting animals to it) is the ideal. If building/modifying a shed, also give consideration to:

- Light – good natural light is the ideal; artificial fluorescent white light is an alternative
- Orientation and ventilation - air flow on a hot day is good; a wind tunnel on a breezy day is not
- Flooring – slatted wooden floors or concrete are good for holding pens
- Shearing board – if the shearer does not use a table, he will often supply a floor covering, such as marine ply, vinyl or heavy rubberised matting. If not, ensure you have a surface which can be kept clean, dry and non-slip
- Internal set up – holding pens, shearing board, overhead power source, working and storage areas
- Cleaning – in advance of shearing day, clean the shed with particular attention to removal of possible fleece contaminants such as: loose fibres from animals previously in the shed; loose feed; baling twine; chaff bags; grit and dirt

People

- Shearer – for the vast majority of shearing operations there will be one shearer. Some shearers may operate two shearing stands (either on shearing tables or the floor) to maximise the number of animals that can be shorn in a day (see diagram below). Book your shearer early and work with him to ensure the day runs smoothly. The shearer will

have his own preferred method of shearing: table or floor; shearing technique (such as the increasingly popular “saddle first” technique). Many breeders are unlikely to be able to influence their shearer’s preferred techniques – you will need to work with him to achieve the best results. Some questions to ask the shearer beforehand (if you have not worked with him before):

  - Does he shear on a table or the floor?
  - Does he bring his own roustabout (assistant)?
  - Does he assist in tethering animals for shearing, or will you need additional hands for this task?
  - Does he provide all his own equipment? Shearing table/floor covering tethers, shearing gear.
  - Does he have his own insurance?
  - What are his fees (per animal or an hourly rate?)
- Alpaca handlers (wranglers) – to move animals from pens to shearing table/floor, assist with tethering, and to take shorn animals back to yards/paddocks
- Board sorter - this task involves sorting and separating the fleece as it comes off the animal. It is a skilled job which will ensure that the various off-sorts (legs, belly and apron) and neck fibre are placed in appropriate bags/bins, and that the prime saddle is collected in optimum condition for skirting.
- Skirter/fleece table sorter – this is a critical job which must be undertaken by someone who has experience and training in skirting and sorting.
- Broom hand/general assistant – the sweeping of the floor between animals is a very important, if seemingly unskilled, job. Lack of attention in this area will lead to fleece contamination (both with coarse hairy fibres and coloured fibres)
- General assistant – if fleeces are being weighed, recorded and sampled at shearing, a specific person will need to take this role.

This may seem a lot of people, and certainly for smaller herds some of the tasks could be combined, but it is a false economy to operate a shearing shed with insufficient people – quality of the end-product (properly sorted and skirted fleece) will be severely compromised.

Equipment

The shearer will generally bring:

- Shearing table (if he uses one)
- Tethers (for table or floor)

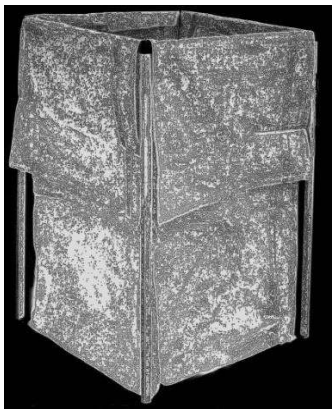
- Shearing gear

Other equipment that you will need to provide includes:

- Skirting table – these can be purchased ready-made or constructed with a wood or metal base with a metal mesh (2cm approx.) top.

Plastic mesh is less suitable as it may generate static which will make skirting more difficult. Traditional wool skirting tables may have a slatted wood top – these are generally not suitable as shorter fleece, such as necks, will fall through the slats.

- Fleece bales and stands – for larger shearing operations, bales for consolidating pieces (good and hairy), and for later packaging of saddle and neck fleece. For smaller operations large polythene bags can be used.



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- Bags for each saddle fleece – clear polythene bags (non-biodegradable) with small holes punched in them (to allow fleeces to breathe and to pack down in bales) are ideal. If using bin bags care will need to be taken that fleeces are not stored in them for extended periods as these bags are designed to break down over time, which will cause irreparable damage to fleece. Chaff bags should NEVER be used as serious contamination will occur.

- Bags for each neck fleece – supermarket plastic shopping bags or other small bin liners will suffice – but note as above about extended storage in such plastic
- Additional bags may be required for pieces if these are to be kept separate rather than consolidated at shearing
- Rubbish bins/bags for heavily stained or contaminated fleece
- Paddles to pick up fleece from shearing board and bring to skirting table

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- Brooms/plastic sweepers/dustpan & brush for keeping floor clean between each animal shorn
- Old towels/rags for absorption of urine. Some people also utilize socks to retain spit from uncooperative alpacas
- ID slips or marker pen/label to identify each saddle within its bag
- Bags for mid-side samples (if these have not been taken prior to shearing)
- AAA colour chart for checking fleece colour
- Ruler – can be marked on edge of fleece table, or colour chart includes one. Useful if need to check if fleece is over or under desired length
- Scales and recording book/computer if recording individual fleece weights
- Lists of animals to be shorn and pen to mark them off once completed – grouped by colour and micron range
- First Aid kits – human and alpaca

Facilities

Remember to consider the following:

- Toilet facilities
- Refreshments/meals/water
- Consult with your shearer regarding how often he likes to take a break
- Phone – mobile or landline for emergencies
- Power – including ideally an overhead power source for the shearer

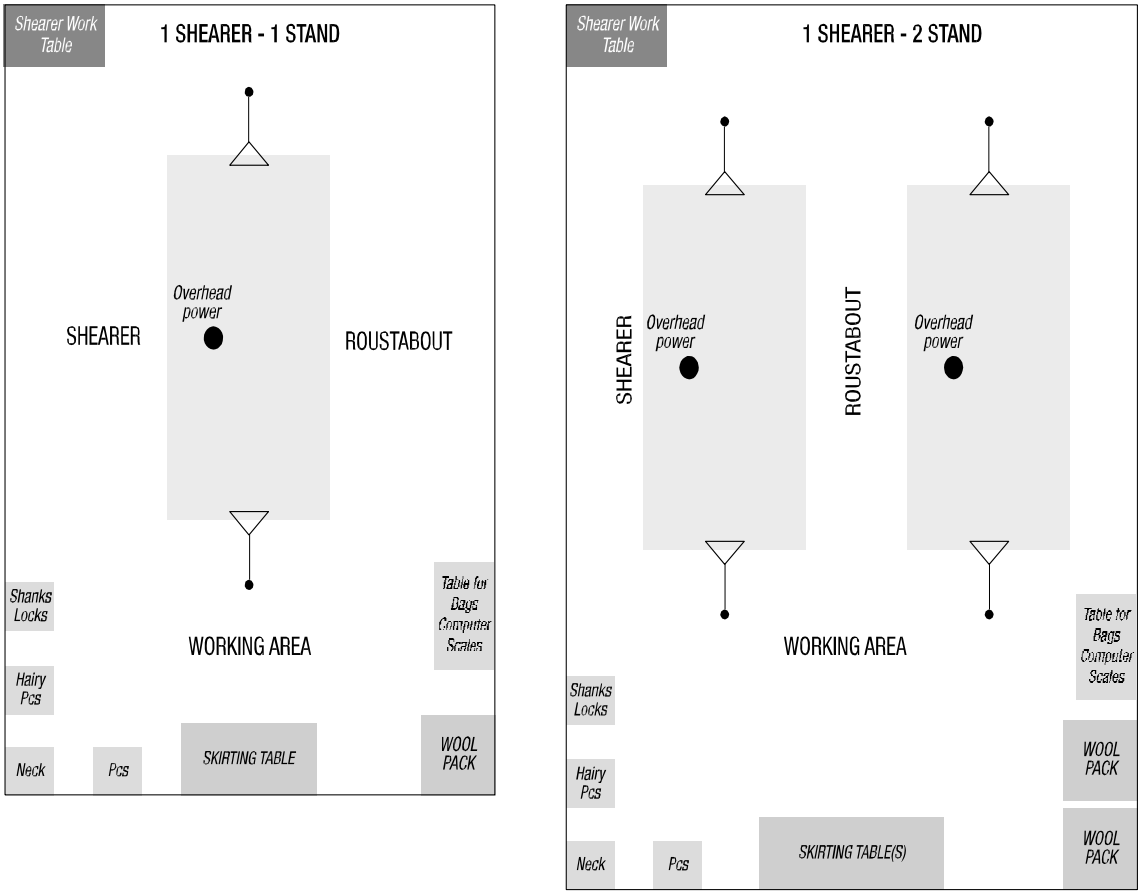
Layout

The exact layout of the shearing shed is going to be governed by the overall size and shape of the shed, together with fixtures that cannot be moved.

The guiding principle is to design a layout which:

- Allows a smooth flow from holding pens to shearing board to shed exit for animals
- Allows a smooth flow from shearing board to skirting table to bags/bales and ultimately to the storage area (possibly including a wool press in larger operations), for fleece
- Provides a safe working environment (see below for further information on Workplace Health & Safety considerations) for all personnel. This includes:
    - overhead power for shearing gear (to eliminate a trip hazard and the risk of accidental damage to a power cord)
    - placement of the anchor points for tethers to avoid shed hands stepping over ropes
    - good lighting (ideally natural light)
    - good ventilation
    - non-slip floor surface

Consider and plan your shearing shed layout well ahead of shearing day.



 Note: the layout above will also work well if two shearers are used

Workplace Health and Safety

A shearing shed is a workplace and as such the operator has obligations under the Workplace Health & Safety Acts to provide a safe working environment. Each state/territory has its own WHS authority and Safe Work Australia has national responsibility for enforcing the legislation.

Conducting a risk assessment in your shed will help identify hazards and risks. Controls can then be put in place to minimise or eliminate these. Appendix 3 provides a template for conducting a risk assessment using a Risk Matrix – a commonly used tool to rank risks according to the severity of the outcome and the likelihood that they will occur. Some of the typical types of hazard to look for are:

- Trips, slips and falls: ropes, extension leads, uneven surfaces or loose floor covering, slippery surfaces (urine, faeces, oil)
- Cuts and scratches: sharp edges, shearing equipment

- Manual handling: lifting animals and full wool packs
- Electrical equipment: trailing power cords, faulty gear

In addition, check the farm's insurance policy in relation to cover for those assisting on shearing day, and speak with your shearer regarding his own insurance cover.

Ensure you have first aid kits (animal and human) and a phone (mobile or landline) in the shearing shed.

Sorting, Skirting and Packaging of Fleece

The correct sorting and skirting of fleece before it is packaged for despatch or storage is *absolutely crucial* to maximising the quality of fleece collected and financial return achieved.

The only way to learn how to sort and skirt fleece is through practical training and experience – new growers are strongly encouraged to attend Regional training days and spend time in the shearing sheds of experienced skirters/sorters to acquire the skill and practice required.

Sorting starts on the *shearing board* (floor or table) as the fleece is being shorn from the animal and continues once fleece is on the skirting table.

Skirting occurs on the *skirting table*, ideally at the time of shearing, though a second skirting may occur later.

Classing is the advanced technique of placing shorn fleece into lines, matched for fineness, length, colour etc. This final stage should be undertaken by an alpaca classer, who has been trained and assessed by AWEX. Classing may be conducted in the shearing shed at shearing (for larger operations) or, more commonly, at a classing house/broker at a later date; it is not the responsibility of the average alpaca fleece grower.

Sorting

Sorting commences on the shearing table or floor, while the shearer is working on the animal. The person responsible for sorting should take

particular care to keep their hands well clear of the shearer's handpiece to avoid injury.

The overall aim of the sorting process is:

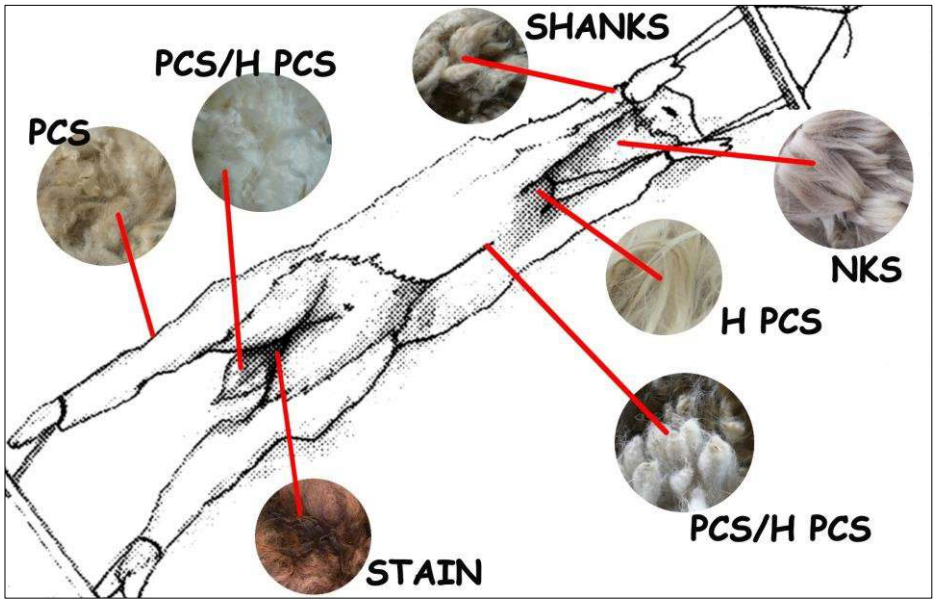
- to avoid contaminating the prime fleece (saddle, plus neck and upper legs) with coarse, hairy fibres from other parts of the animal (belly, apron, lower legs)
- to match like with like

Observe the sequence in which your shearer removes the fleece from the animal and work with him to separate and sort:

- **Saddle** – this may be shorn from the animal in one piece, or as two sides, depending on shearing technique. It should be carefully carried to the skirting table using paddles/garden hands and thrown onto the table with the outside (weathered tip) facing up. If it is absolutely impossible, due to space/labour limitations to skirt at shearing, then the fleece should be rolled and bagged for skirting at a later date (see page 20 for further information).
- **Necks** – most neck fibre will be good quality but needs to be separated as it is shorter in length. Some suris will produce neck fibre that is almost as long as the saddle fleece. Each neck should be placed in a separate bag, which can then be baled together by colour.
- **Good pieces** – on good quality animals these may come from part of the belly and middle legs (>50mm in length). Good pieces can be placed in bags/bales sorted into matching colours.
- **Hairy pieces** – typically from the apron, belly and middle legs (though good quality animals may have minimal hairiness on middle legs) and should be >50mm in length. If shorn first, these pieces should be removed quickly and thoroughly to avoid contamination of prime fleece. Bag/bale as for good pieces keeping each colour separate
- **Lower legs (shanks)** – this fleece will generally be short (<50mm), coarse and hairy. There can be markets for this fibre but it should be kept separate from longer hairy pieces.
- **Heavy VM** – fleece that is heavily contaminated with vegetable matter (VM) should be removed; this may occur on the shearing flooror on the skirting table. There may be a market for this fibre, but for many producers it will be consigned to rubbish.
- **Sweepings from the floor (locks)** – floor sweepings should be kept separate. There may be a market for this fibre, but for many producers it will be consigned to rubbish.
- **Stain -** fleece heavily stained with urine, faeces, water, coloured

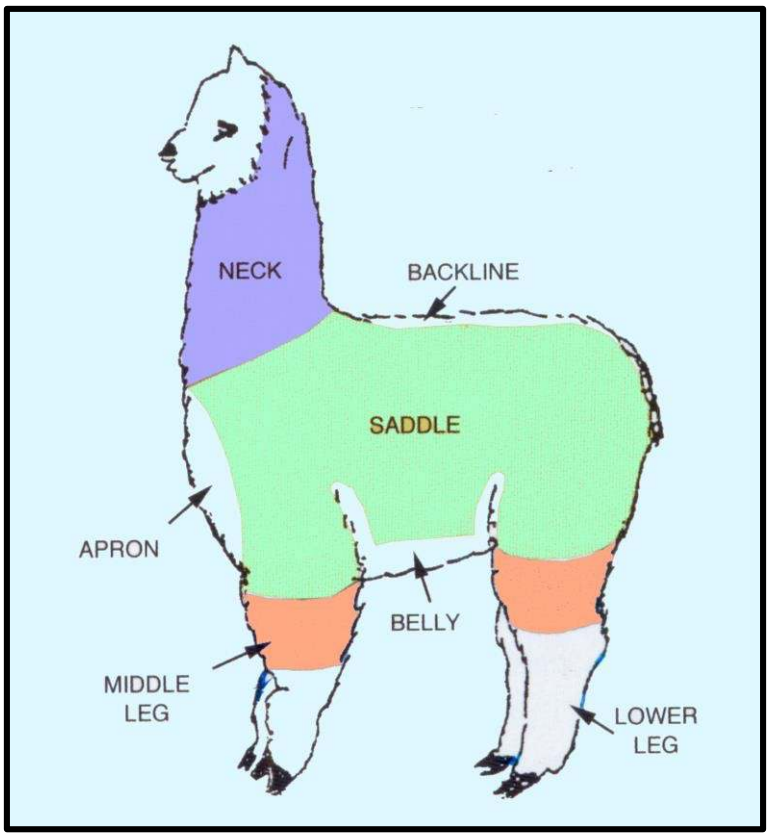
antiseptic sprays or mud should be separated. There is unlikely to be a market for this fibre and it should be consigned as rubbish.

- **Off-coloured fibres** – remove any obvious spots that are of a different colour to the main fleece.



The illustration below shows approximately where each section of alpaca fleece is located; however, bear in mind that these areas will vary from animal to animal:

- In poor quality, older animals the hairy parts of the apron and belly will extend much further, reducing the size of the saddle.
- In a high quality or younger animal, the middle leg may be sufficiently similar to the saddle to be included with it.
- In a high quality suri, some of the neck fleece may be sufficiently similar in length and quality to be included with the saddle



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Skirting

The process of skirting the saddle of the fleece occurs on the skirting table. Remember, the saddle is the most valuable part of the fleece – insufficient care with skirting will greatly reduce the value of the fibre.

The saddle fleece should be brought to the skirting table using paddles (or garden hands) and placed with the outside weathered tip uppermost. Dependent on shearing technique the saddle may be shorn in one piece or as two halves. Before commencing the skirting process, work out the orientation of the shorn fleece by identifying:

the base of the neck – where there is often a “bird’s nest” of VM
the backline – often more contaminated due to rolling
the belly – which will be more hairy
the tail – where there is likely to be more stain from urine or faeces

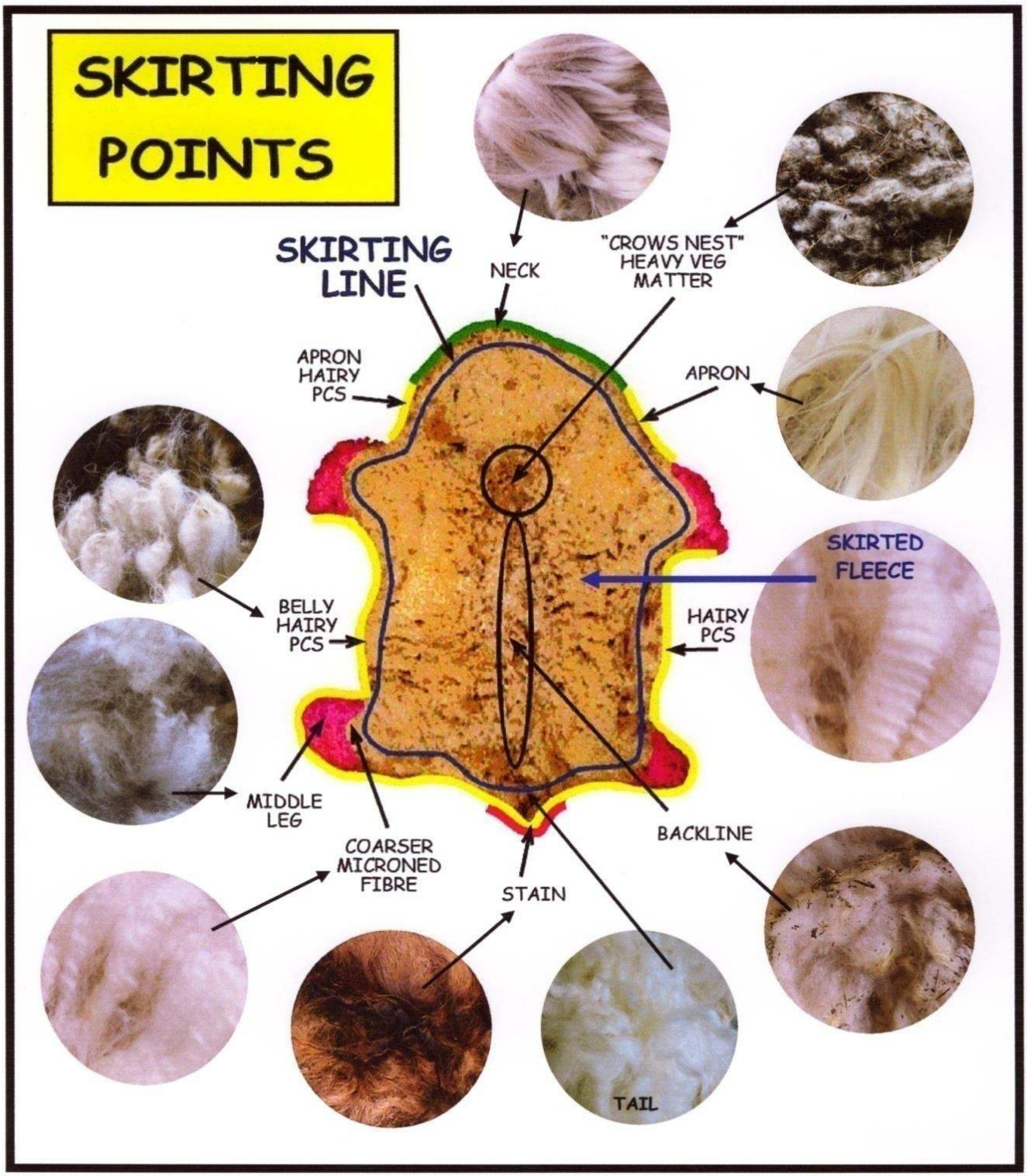
The skirter now works around the shorn fleece removing:

- coarse (hairy) fibres
- VM
- Fibres of differing length (middle legs or neck)
- Stain
- “Second cuts” – these very short fibres will often fall through the mesh of the table if the fleece is gently shaken
- Coloured fibres – a single spot can easily be removed; coloured fibres scattered throughout the fleece cannot and will greatly reduce the value of the fleece. A white fleece contaminated with fawn fibres will need to be baled with fawn fleece.
- Tender fibres – check the fleece for tender (breakable) fibres by
- removing a staple/lock and pulling it firmly. If the fibre breaks it is “tender” and will not withstand processing. If just a small section is tender (often down the backline) it can be removed. If tender fibres are found throughout the fleece it should be kept separate and the bag marked accordingly.

As skirtings are removed from the saddle they should be matched with similar pieces (good or hairy) that were removed on the shearing floor and placed in the same bags/bales (with separate bags/bales for each colour).

The illustrations below show the approximate skirting lines for huacaya and suri. Remember that the exact line will vary with the quality and age of the animal.

Huacaya



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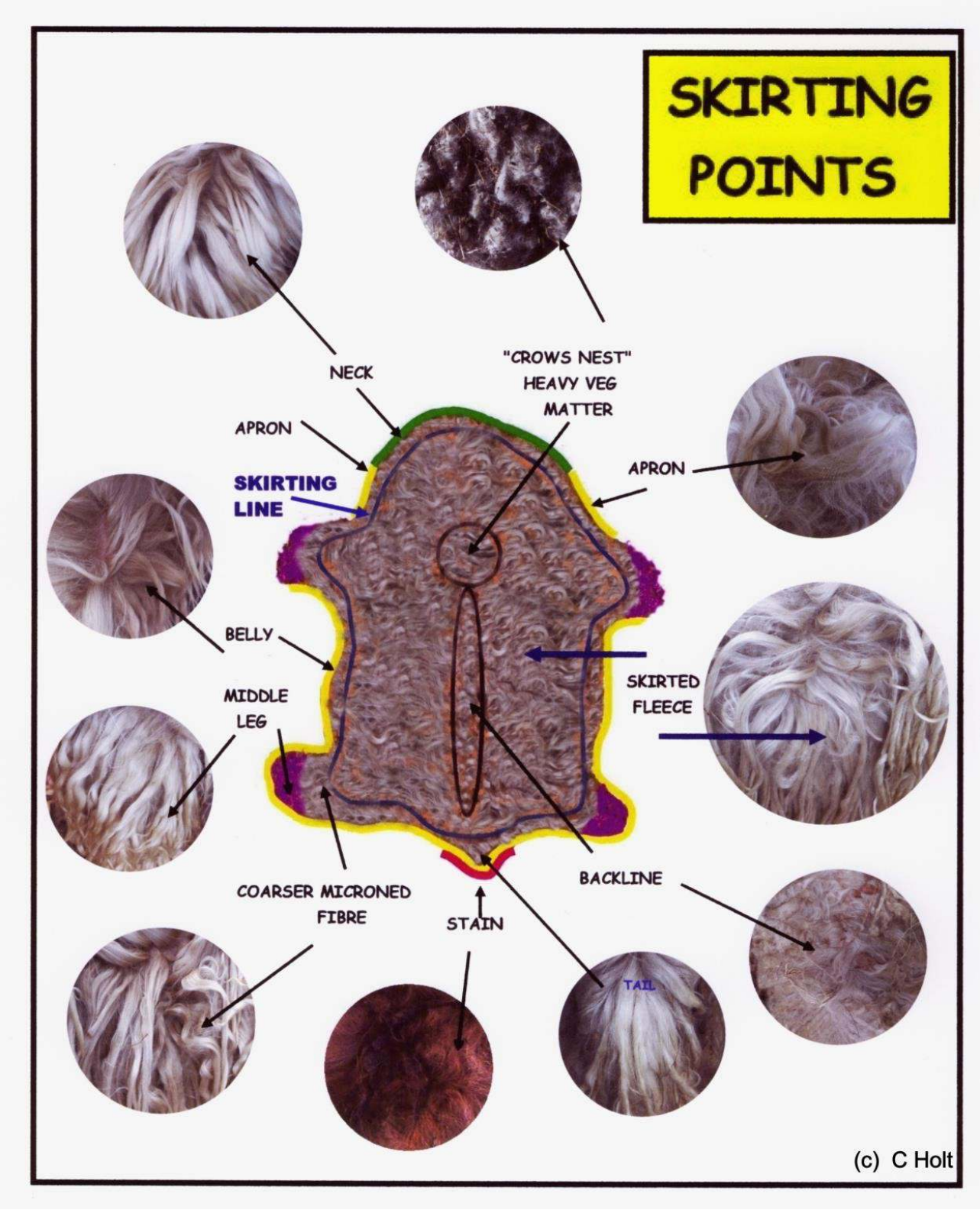
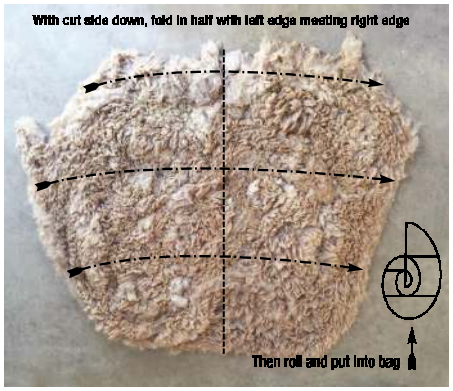
Suri

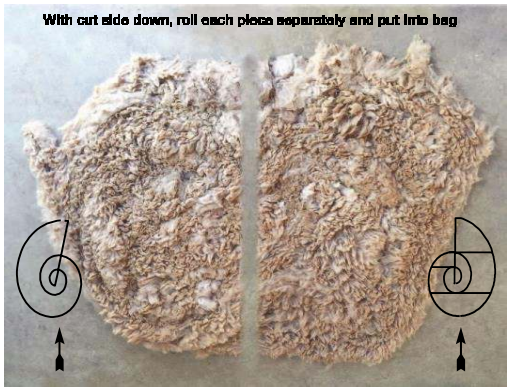


Once skirting is completed the saddle needs to be placed in an individual bag. A huacaya fleece can be folded and rolled as shown below. Some suri fleeces will hold together sufficiently for similar treatment. If not, a fully skirted suri fleece can be folded in half and slid into the bag.

ROLLING A ONE PIECE FLEECE



ROLLING A TWO PIECE FLEECE



Skirting at a later date

It is far preferable to at least roughly skirt fleeces immediately they are removed from the animal. Failure to do so may reduce the value of the fleece due to contamination. If it is absolutely impossible to skirt fleeces as they are shorn then huacaya fleeces can be rolled as described above and placed in bags for later skirting.

An alternative (which is essential for suri fleece but will also work well with huacaya) is to place the unskirted fleece on a large sheet of paper or very thin plastic and roll it into a sausage before placing the roll into a bag. The fleece can then later be unrolled for skirting. Failure to use the paper/plastic sheet will result in the fleece becoming entangled and contamination of prime fleece with unskirted hairy fibres will have occurred, rendering the entire saddle virtually worthless.

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Packaging

Exactly how fleece is packaged will depend upon the requirements of the classing house/purchaser/processor and also upon the confidence of the person who has undertaken the sorting and skirting processes.

- **Skirted saddle:** each saddle is generally placed in an individual large, clear, non-biodegradable polythene bag with small holes punched in it. Several fleeces of matching colour and quality can be put in one bag, with sheets of newspaper between. NEVER use second hand bags or chaff bags – the contamination caused will render your fleece valueless. Do not tie the tops of the bags. Bags can then be consolidated into bales, with colours kept separate.
- **Necks:** each neck should be placed in an individual plastic shopping bag or similar. These bags can then be consolidated into larger bags or bales, again separated by colour. Do not tie the tops of bags
- **Good pieces:** if the skirter/sorter is confident in their ability, all good pieces can be consolidated directly into larger bags/bales by colour. If not, then pieces from each animal can be placed in smaller bags (as with neck fibre), for the classer to check.
- **Hairy pieces:** follow the same procedure as for good pieces, depending on the skill and confidence of the sorter/skirter

Paperwork

Depending on where the fleece is going, there will be some form of Consignment Note, summarising the content of the total clip being sent. An example is shown in Appendix 4. Be sure to fill this paperwork in carefully and accurately to ensure you receive payment for your fleece.

Storage

If it is necessary for fleece to be stored before transport for sale/processing ensure that:

- Fleeces are bagged and either pressed in bales or stored in containers which will exclude moths, insects and rodents
- Store in dry area with good air circulation. Check regularly for signs of vermin infestation or mildew in humid climates
- Ensure all bags/bales/containers are clearly labelled with their contents

APPENDIX 1 Taking a Sample

Taking a 3-point sample

Some growers may opt to take a 3-point sample instead of, or in addition to, the more commonly used mid-side test. A 3-point sample gives a better representation of the micron and uniformity of the entire saddle, rather than the quality of the fleece at its mid-side point only. The results for a 3- point test will generally be higher for both micron and SD than a mid-side test.

The test involves taking 3 samples from *one side* of the saddle. This can be done directly from the animal, as for a mid-side, but including a sample from the shoulder and the pin-bone.

If done from a shorn fleece:

Identify the backline of the fleece.
Remove a small sample from three points, about 20cm (or less on a fleece from an animal that is not fully grown) down from the backline. This will equate to a mid-side sample, a shoulder and a pin-bone sample.
Combine the samples in a paper sample bag identified with the animal's name or number
Ensure the testing laboratory is aware that this is a sample taken from 3 points.

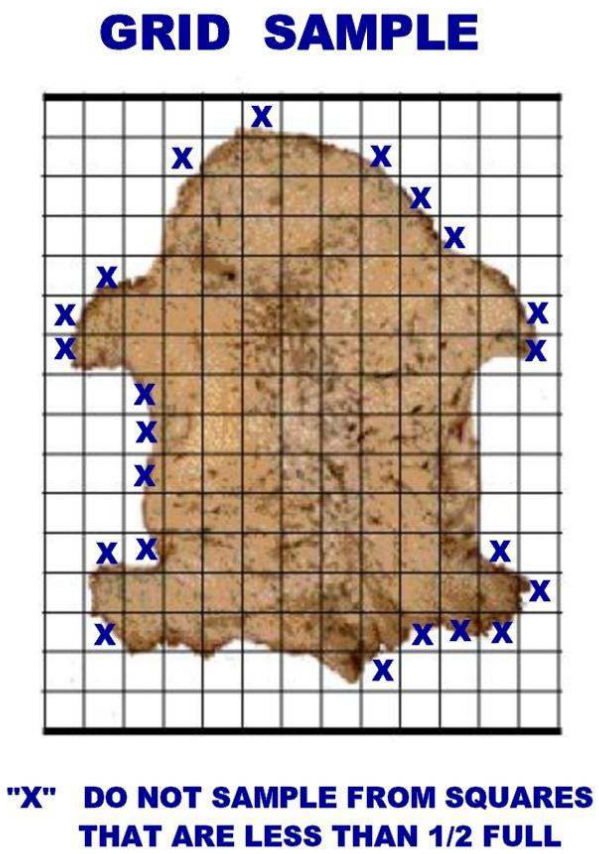
Taking a grid sample

A grid sample is the most complex method of fleece testing and is rarely used by the individual fibre grower. It does however give a representation of the quality of the *entire saddle*.

- The entire saddle (both halves) is placed on the skirting table, with the side closest to the skin downwards on the table.
- A grid made of mesh approximately 100x100mm is placed over the entire fleece.
- A staple/lock of fleece is taken from each square filled or more than half-filled with fibre (squares that are less than half full are not sampled).

- The combined samples are placed in a fleece sample bag and identified with the animal's name/number

On sending samples to the testing lab it is essential that they are informed that these are grid samples. This ensures they then take a sub-sample which includes fibres from the entire sample sent; this avoids bias in the results due to only some of the fibres being tested.



Research by Davison and Holt (2004) looked at the difference between a grid sample from a skirted huacaya fleece and a mid-side sample taken from the animal before shearing. The average difference between the two tests was 0.4 micron. Clearly the variance across the fleece, and therefore between the two test results, will differ greatly with the quality of the animal.

APPENDIX 2 Understanding a fleece test result

When a fleece sample is sent to the lab for analysis, results will be returned in the form of a range of statistical numbers together with a “histogram” – a graphical representation of the measurement of each individual fibre in the sample.

At first sight, histograms and the associated abbreviations and numbers on them, can be daunting. However, by learning how to read the significance of the numbers and the shape of the graph, a great deal can be learnt about the fleece of the animal.

The most frequently quoted measurements which need to be understood are: Fibre Diameter; Standard Deviation; Co-efficient of Variation.

Fibre Diameter (FD)

This is often referred to as “micron” or “µ”, “mean fibre diameter” or simply “mean”. A micron (µ) is actually 1 millionth of a meter and is the standard unit of measurement for all natural fibres. As individual fibres within a sample will all vary slightly in their diameter, the FD is actually the mean diameter of all the fibres tested in a sample.

Standard Deviation (SD)

The Standard Deviation tells you how similar in micron the fibres are across the sample – also referred to as the “uniformity” of the sample. What the SD is actually telling you is how the micron of the majority of the fibres in the sample are spread either side of the mean.

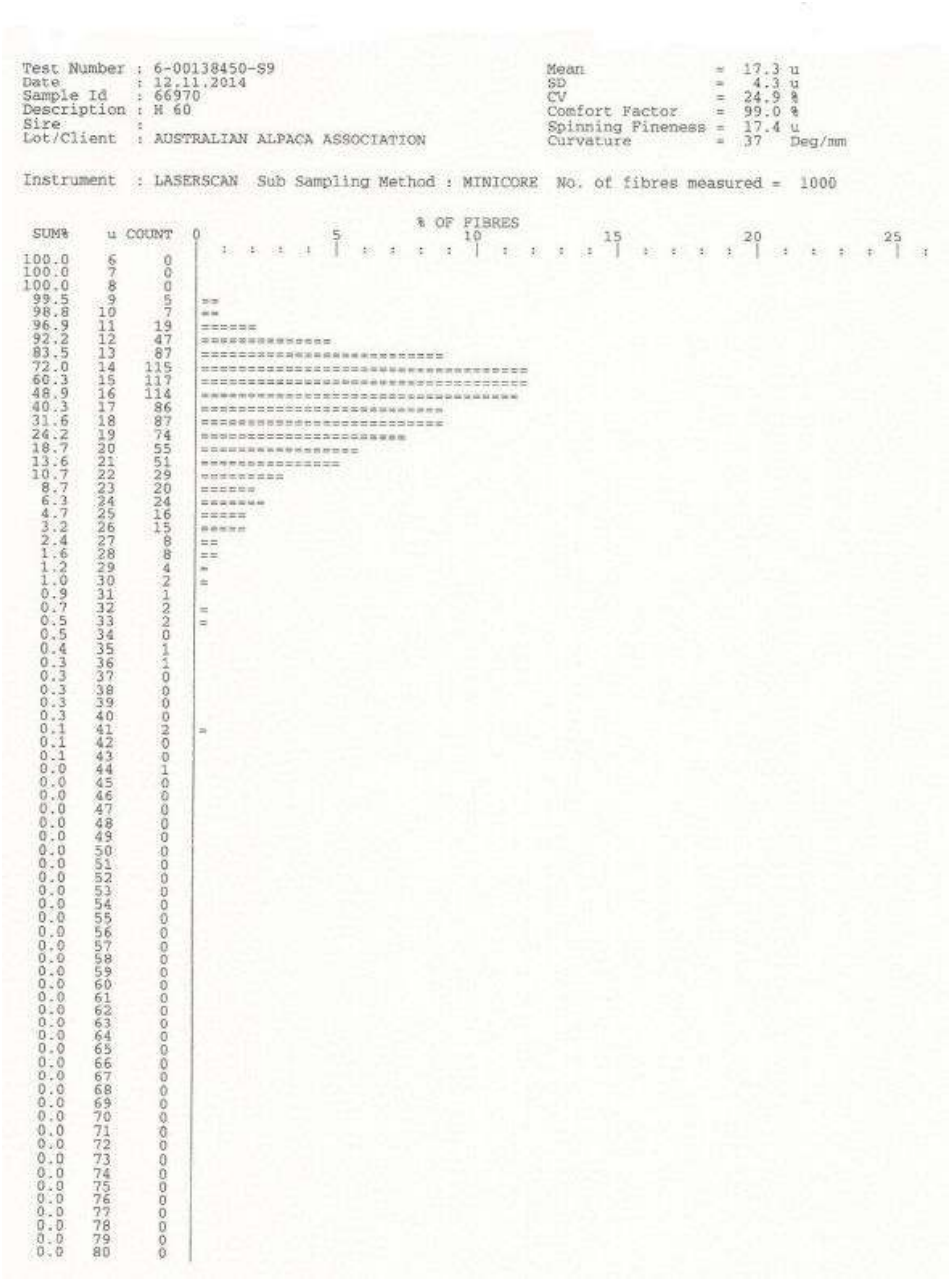
For example, if the Mean Fibre Diameter is 20µ and the SD is 4µ, this means that two-thirds (66%) of the fibres in the sample are between 16µ (4µ below the mean) and 24µ (4µ above the mean).

An SD below 4.5µ is good; even lower will greatly enhance the value of the fibre for the processor.

Co-Efficient of Variation (CV)

This is another way of measuring the uniformity of fibres within a sample, but this time expressed as a percentage, where the SD is expressed as a percentage of the mean FD.

Below are two histograms, from different testing labs, showing the same information but in a differing format.

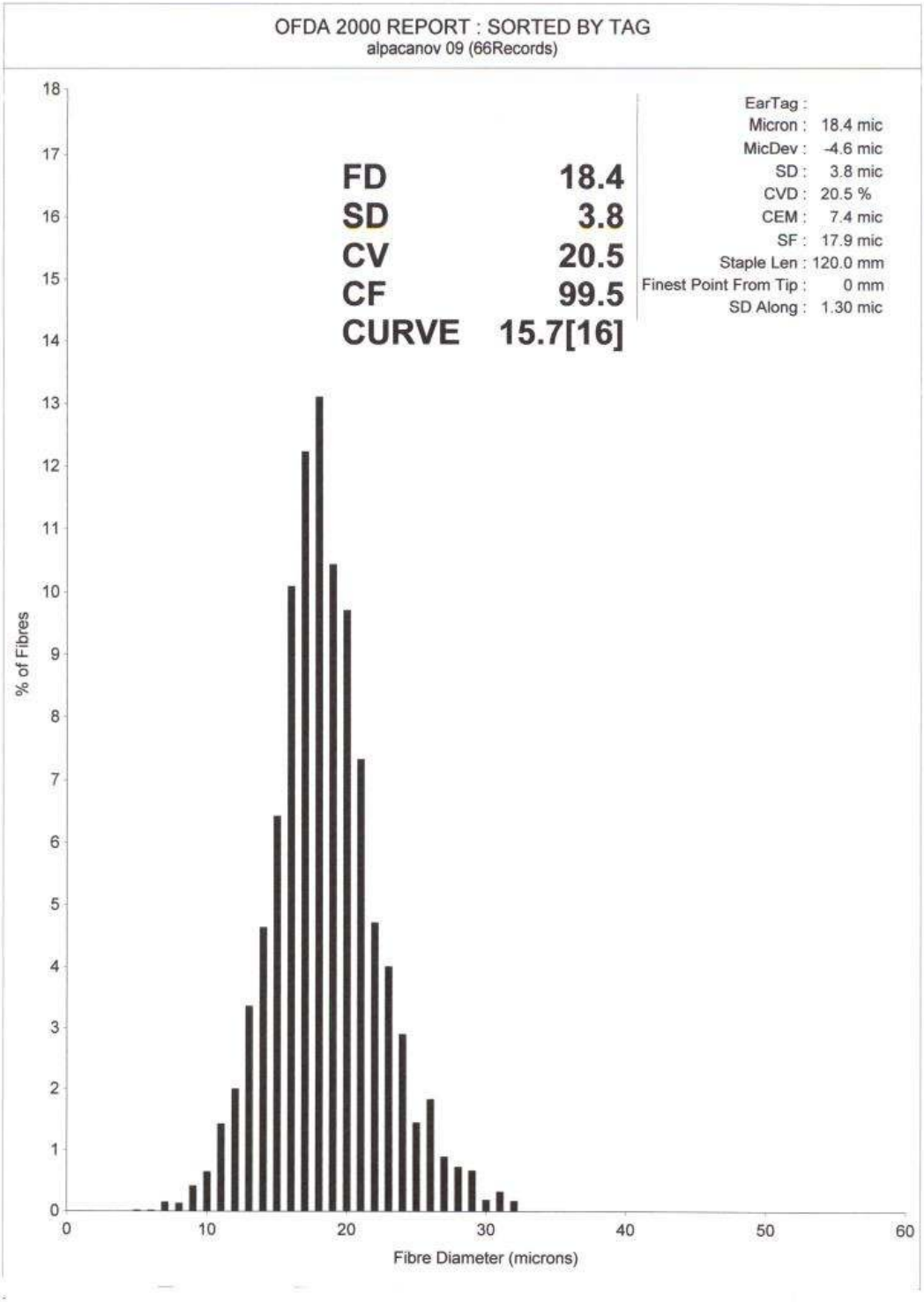


```
Test Number : 6-00138450-S9                          Mean              =  17.3 u
Date        : 12.11.2014                             SD                =   4.3 u
Sample Id   : 66970                                  CV                =  24.9 %
Description : M 60                                   Comfort Factor    =  99.0 %
Sire        :                                        Spinning Fineness =  17.4 u
Lot/Client  : AUSTRALIAN ALPACA ASSOCIATION          Curvature         =  37   Deg/mm

Instrument  : LASERSCAN  Sub Sampling Method : MINICORE  No. of fibres measured =  1000

                                                % OF FIBRES
 SUM%     u COUNT  0              5              10             15             20             25
                   |  :  :  :  :  |  :  :  :  :  |  :  :  :  :  |  :  :  :  :  |  :  :  :  :  |  :
100.0     6     0 |
100.0     7     0 |
100.0     8     0 |
 99.5     9     5 |==
 98.8    10     7 |==
 96.9    11    19 |======
 92.2    12    47 |===============
 83.5    13    87 |============================
 72.0    14   115 |=====================================
 60.3    15   117 |======================================
 48.9    16   114 |=====================================
 40.3    17    86 |============================
 31.6    18    87 |============================
 24.2    19    74 |========================
 18.7    20    55 |==================
 13.6    21    51 |================
 10.7    22    29 |=========
  8.7    23    20 |======
  6.3    24    24 |=======
  4.7    25    16 |=====
  3.2    26    15 |=====
  2.4    27     8 |==
  1.6    28     8 |==
  1.2    29     4 |=
  1.0    30     2 |=
  0.9    31     1 |
  0.7    32     2 |=
  0.5    33     2 |=
  0.5    34     0 |
  0.4    35     1 |
  0.3    36     1 |
  0.3    37     0 |
  0.3    38     0 |
  0.3    39     0 |
  0.3    40     0 |
  0.1    41     2 |=
  0.1    42     0 |
  0.1    43     0 |
  0.0    44     1 |
  0.0    45     0 |
  0.0    46     0 |
  0.0    47     0 |
  0.0    48     0 |
  0.0    49     0 |
  0.0    50     0 |
  0.0    51     0 |
  0.0    52     0 |
  0.0    53     0 |
  0.0    54     0 |
  0.0    55     0 |
  0.0    56     0 |
  0.0    57     0 |
  0.0    58     0 |
  0.0    59     0 |
  0.0    60     0 |
  0.0    61     0 |
  0.0    62     0 |
  0.0    63     0 |
  0.0    64     0 |
  0.0    65     0 |
  0.0    66     0 |
  0.0    67     0 |
  0.0    68     0 |
  0.0    69     0 |
  0.0    70     0 |
  0.0    71     0 |
  0.0    72     0 |
  0.0    73     0 |
  0.0    74     0 |
  0.0    75     0 |
  0.0    76     0 |
  0.0    77     0 |
  0.0    78     0 |
  0.0    79     0 |
  0.0    80     0 |
```

Vertical axis shows micron (μ)

Horizontal axis shows the percentage of fibres at each different micron (μ)

Mean fibre diameter (here shown as “Mean”) is 17.3μ, ~~and~~ SD is 4.3μ and CV is 24.9%



Horizontal axis shows micron
Vertical axis shows the percentage of fibres at each different micron
Mean fibre diameter (here shown as “Micron”) is 18.4µ, ~~and~~ SD is 3.8µ and CV is 20.5%

APPENDIX 3 Workplace Health & Safety: Risk Assessment

A risk assessment should be conducted prior to shearing to identify any hazards and assess risks. Controls should then be put in place to eliminate or reduce hazards and lower the risks identified.

An appropriately stocked first aid kit should be close at hand in the near vicinity of the shearing area/shed.

Conducting a Risk Assessment:

1. **Identify Hazards**
   Assess the shearing shed set-up to identify all possible hazards such as slips, trips, falls etc
   (see the checklist below for examples)
2. **Assess Risks**
   Consider each hazard and assess the risk by asking yourself:
   "What would be the ***consequence*** if this happened?" Would there be injuries? If so,
   how severe would they be?
   "What is the ***likelihood*** of this happening" Certain? Likely? Unlikely?

   By considering Consequences and Likelihood together, using the risk matrix below you can decide on the overall risk of each hazard:

RISK MATRIX		**CONSEQUENC**				
		Insignificant (no injuries)	**Minor (minor injuries/first aid required)**	**Moderate (medical treatment required)**	**Major (extensive injuries, hospitalisation required)**	**Extreme (Major injuries or fatalities)**
LIKELIHOOD OF HARM OCCURING	**Certain**	**Low**	**Medium**	**High**	**High**	**High**
	Likely	**Low**	**Medium**	**Medium**	**High**	**High**
	Possible	**Low**	**Medium**	**Medium**	**High**	**High**
	Unlikely	**Low**	**Low**	**Medium**	**Medium**	**High**
	Rare	**Low**	**Low**	**Low**	**Medium**	**Medium**

3. **Control the Risk**

High Risk: Action required before proceeding. The risk must ideally be *eliminated,* or at least lowered, before work commences

Medium risk: Action required before proceeding. The risk needs to be lowered as much as
is practical to do so and safe work procedures to manage the risk implemented.

Low risk: Manage by routine safe work procedures

Use the checklist below to identify hazards, assess risk and set in place controls.

CHECKLIST (with examples of typical hazards)

Item	Hazard	Risk Level			Control Action	Done
		Low	Medium	High		
1	**Trip hazards** *(eg. ropes, extension leads, uneven ground, floor mats, power cords, equipment in walking areas)*					
2	**Fall hazards** *(eg. Flooring at differing height, holes, structural projections)*					
3	**Slip hazards** *(eg. Slippery surfaces, steep slopes, puddles, animal urine, animal faeces,*					
4	**Cut and scratch hazards** *(eg. Objects and projections with sharp*					
5	**Manual handling hazards** *(eg. Lifting animals, moving full wool bales, pulling dragging lifting other equipment)*					
6	**Livestock** *(eg. running, biting, kicking, spitting)*					
7	**Plant and equipment hazards** *(eg. faulty electrical equipment, fumes,*					
8	**Hazardous chemicals** *(eg. Spill risk, stored too close to shearing area)*					
9	**Other** *(eg. fire risk, animal health issues, smoking)*					

CHECKLIST (Blank template)

Item	Hazard	Risk Level			Control Action	Done
		Low	Medium	High		
1	**Trip hazards**					
2	**Fall hazards**					
3	**Slip hazards**					
4	**Cut and scratch hazards**					
5	**Manual handling hazards**					
6	**Livestock**					
7	**Plant and equipment hazards**					
8	**Hazardous chemicals**					
9	**Other**					

APPENDIX 4 Sample Consignment Note

ALPACA RECEIVAL MANIFEST

Please Deliver to Wool Auctions of Australia
21 Pine Rd Yennora NSW.

Schute Bell Badgery Lumby

Trading Name

Full Postal Address

Phone/Mobile

Email

ABN GST REG (Y or N)

Payment Details (CHO)EFT Please supp'y Bank Details tf EH)

Colour Description	Weight	No of Bales/Bags
White		
Lt Fawn		
Fawn		
Brown		
Dark Brown		
Brown Black		
Grey		
Dark Grey		
Rose Grey		
Black		
Lt Skirtings		
Dk Skirtings		
Pieces		
Total		

• Please refer to COP for Colour Combinations

Deelration by Owner/Manager
All fibre listed above has been grown in I\ustralia

Signed Print Name

Date