

BISON “DOWN”



*Presentation by
Adele Boucher, Fibre Coordinator,
Canadian Bison Association*

What is “Down”?

- the insulation coat that grows under the outer hair coat
- ranks as an exotic fibre in the same group as qiviut from muskox, cashmere from goats, and camel and yak down
- very fine fibres about the same micron size as cashmere
- a new coat is shed every spring by all buffalo so is considered a renewable resource
- colour may vary depending on the area of the body, exposure to sunlight, and black buffalo shed a darker colour
- buffalo grow a coat of five fibres...

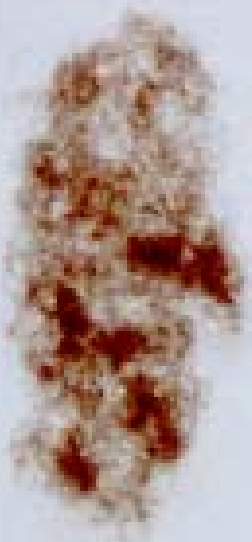


What is “Down”?



		(Micron size)
1.	Delicate curly fibre like cotton fluff, or “down”	21-24
2.	Fine light brown/beige/white hair approximately same size as alpaca hair	30-32
3.	Medium brown hair about the same size as human hair	36
4.	Coarse brown outer hair	55
5.	The stiff black hairs found in the cape and tail	98

Sample of Buffalo Coat



1

21-24



2

30-32



3

36



4

55



5

98

(Micron Size)

What is “Down”?



Raw fibre is collected by picking “fluff” off fences, bushes, or rubbing-posts and brushes. Common price for raw fibre is \$1.00/ounce

Properties of “Down”

- has a staple length of 1 – 2 inches
- contains no lanolin so does not dye or bleach well
- will not shrink if washed and rinsed in same temperature water, and must be dried naturally without heat
- must be washed gently without agitation or fibres will felt easily
- Has high medulation, or insulating properties, and is soft, warm, and durable
- Early lab analysis indicate that a large percentage of down is under 30 microns in size, thus yielding a high comfort factor



History of Bison Fibre in Canada

- Selkirk Settlers who came from Scotland into the Red River area in 1812 used buffalo fibre for clothing
- During 1820-24 there was a Buffalo Wool Company which exported goods back to Britain
- The fibre was considered drab compared to bright colors in silk, and the fibre had not been fully dehaired, therefore, the goods were coarse.
- The natives did not use “down” for a textile purpose but as an insulator, such as liners for moccasins, or for diaper filling
- The Cree word for “*bison hair rubbed off and fluffed up on bushes*” is **“omestanpewayanah”**



Simple Collection Methods

Past Experiences - Successes and Failures

- Previous collection methods using brushes seemed to work well – in that they did a great job of cleaning the buffalo! Any loose hairs and any debris within the buffalo's coat became snagged in a tangled mass on these brushes – whether they were the street sweeper type, or a variety of shop floor-broom types.
- Problems occurred because the fibre became all wound up around the bristles of the brushes, and after being removed from the brushes, it was nearly impossible to untangle the fibre so it could be carded and dehaired.

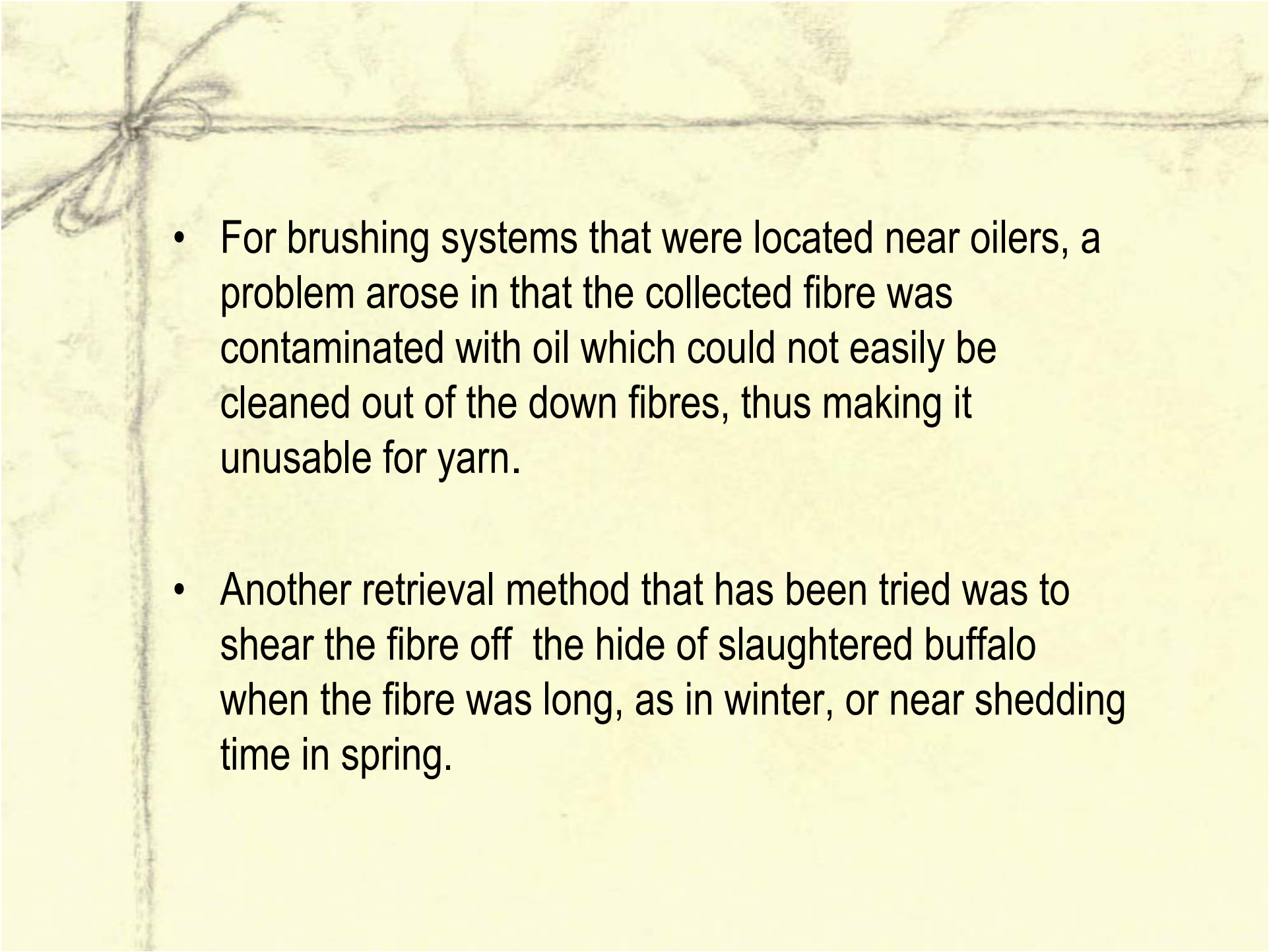
Past Experiences - Successes and Failures

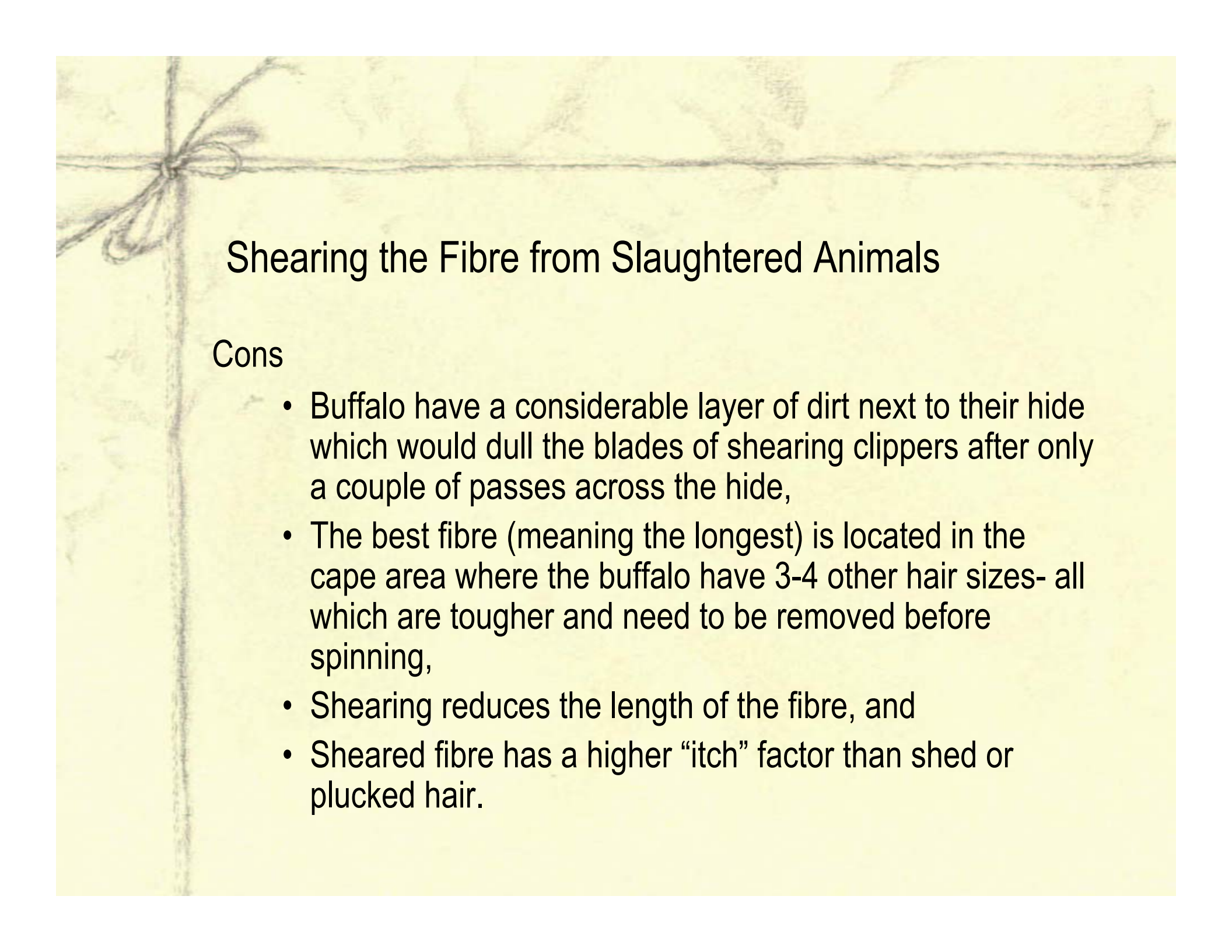


Street Sweeper



Custom Built

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- For brushing systems that were located near oilers, a problem arose in that the collected fibre was contaminated with oil which could not easily be cleaned out of the down fibres, thus making it unusable for yarn.
 - Another retrieval method that has been tried was to shear the fibre off the hide of slaughtered buffalo when the fibre was long, as in winter, or near shedding time in spring.



Shearing the Fibre from Slaughtered Animals

Cons

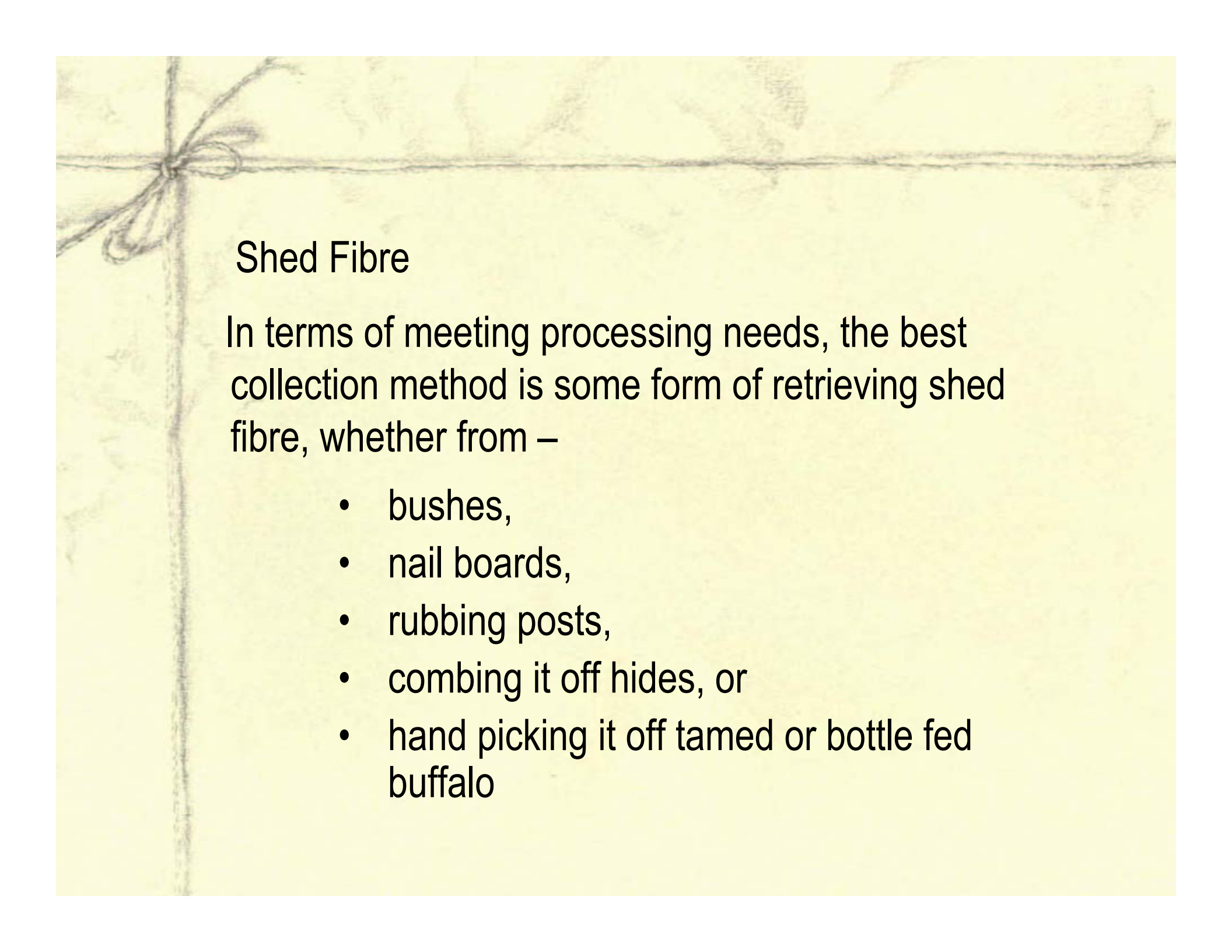
- Buffalo have a considerable layer of dirt next to their hide which would dull the blades of shearing clippers after only a couple of passes across the hide,
- The best fibre (meaning the longest) is located in the cape area where the buffalo have 3-4 other hair sizes- all which are tougher and need to be removed before spinning,
- Shearing reduces the length of the fibre, and
- Sheared fibre has a higher “itch” factor than shed or plucked hair.

Shearing the Fibre from Slaughtered Animals

Pros

- If the hides of the animals are already in the shedding stage, it is possible to comb/brush/pluck the actual “Down” fibre off the hide in a relatively clean state
- Shed fibre is the ideal form to work with in terms of spinning – it is cleaner, longer, has no blunted cut end, and is less tangled.





Shed Fibre

In terms of meeting processing needs, the best collection method is some form of retrieving shed fibre, whether from –

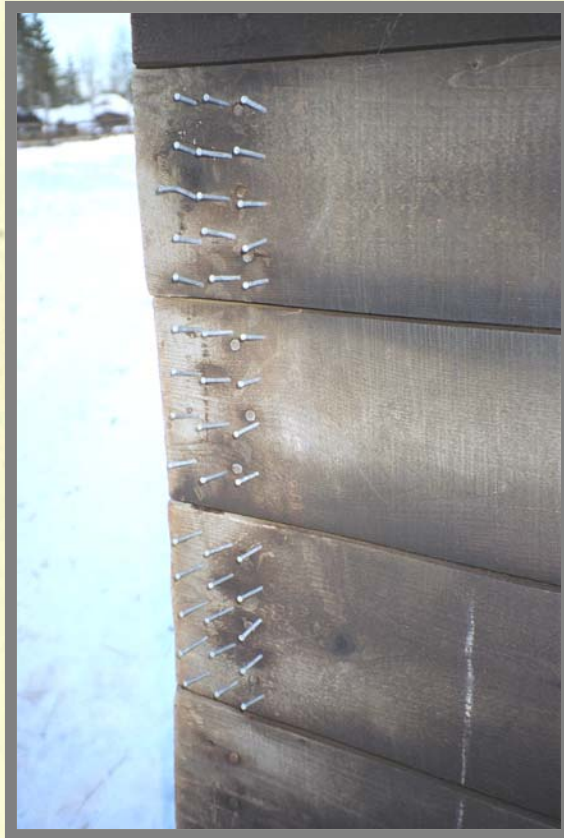
- bushes,
- nail boards,
- rubbing posts,
- combing it off hides, or
- hand picking it off tamed or bottle fed buffalo



For Shed Fibre

- Pound 3½ inch finishing nails, approximately 1 inch apart and to a depth of 2 inches, into any surface where the buffalo tend to rub or scratch
- 1½ inches of the nail are exposed to grab the shed fibre, and are easily cleaned by using a type of hair-pick to remove the collected fibre
- Any or all sizes of buffalo may rub on the nails, therefore, it is recommended a box with a protective lip be built around the nails to prevent the animals – with their great strength and weight – from bending the nails
- It is a good idea to stain the nail box with earth tone colours so the buffalo will not see it as a foreign object

Recommended Methods



Random Nailing



Nail Board

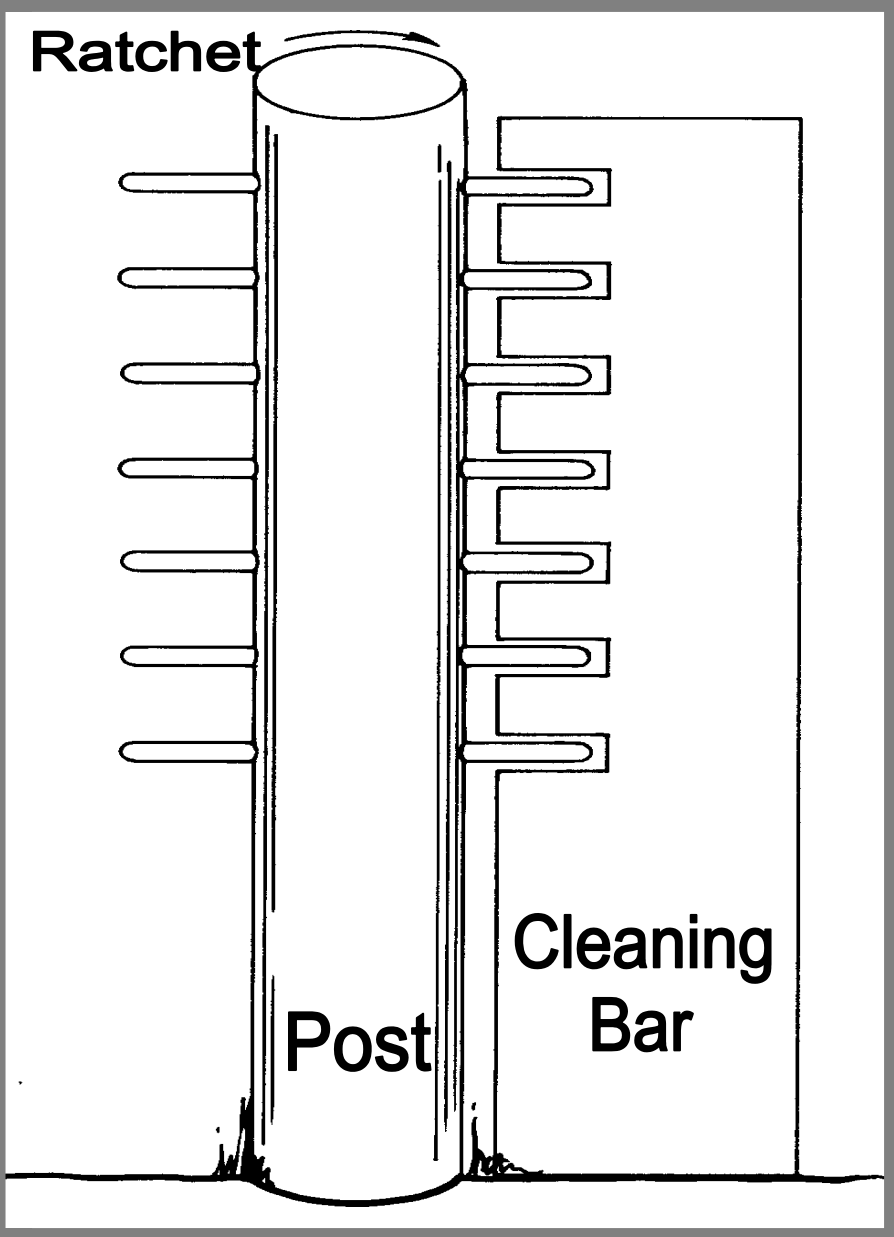
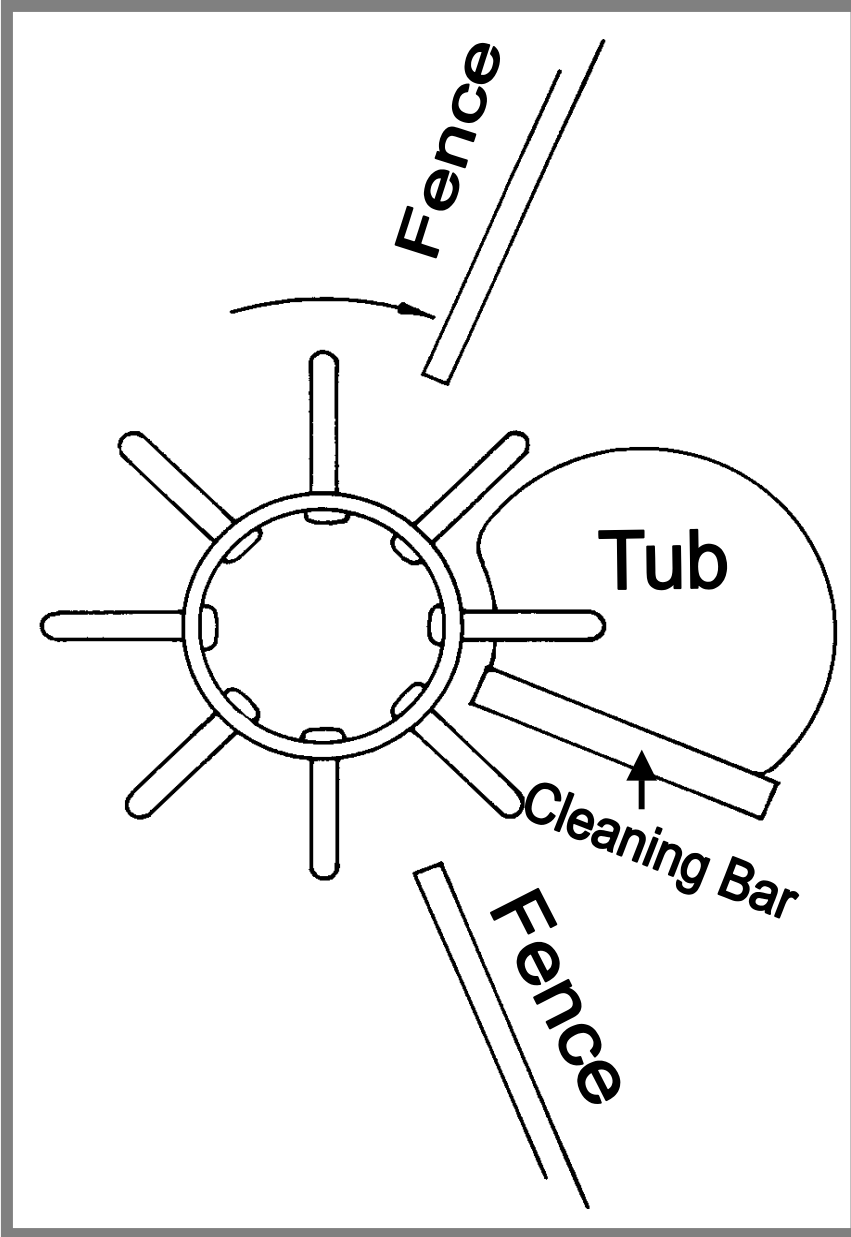


Challenges to Developing this By-Product

1. *Invention of an involuntary collection system*

The following concept for a self-cleaning rubbing post (see diagram) was presented to Olds College Centre for Innovation (OCCI):

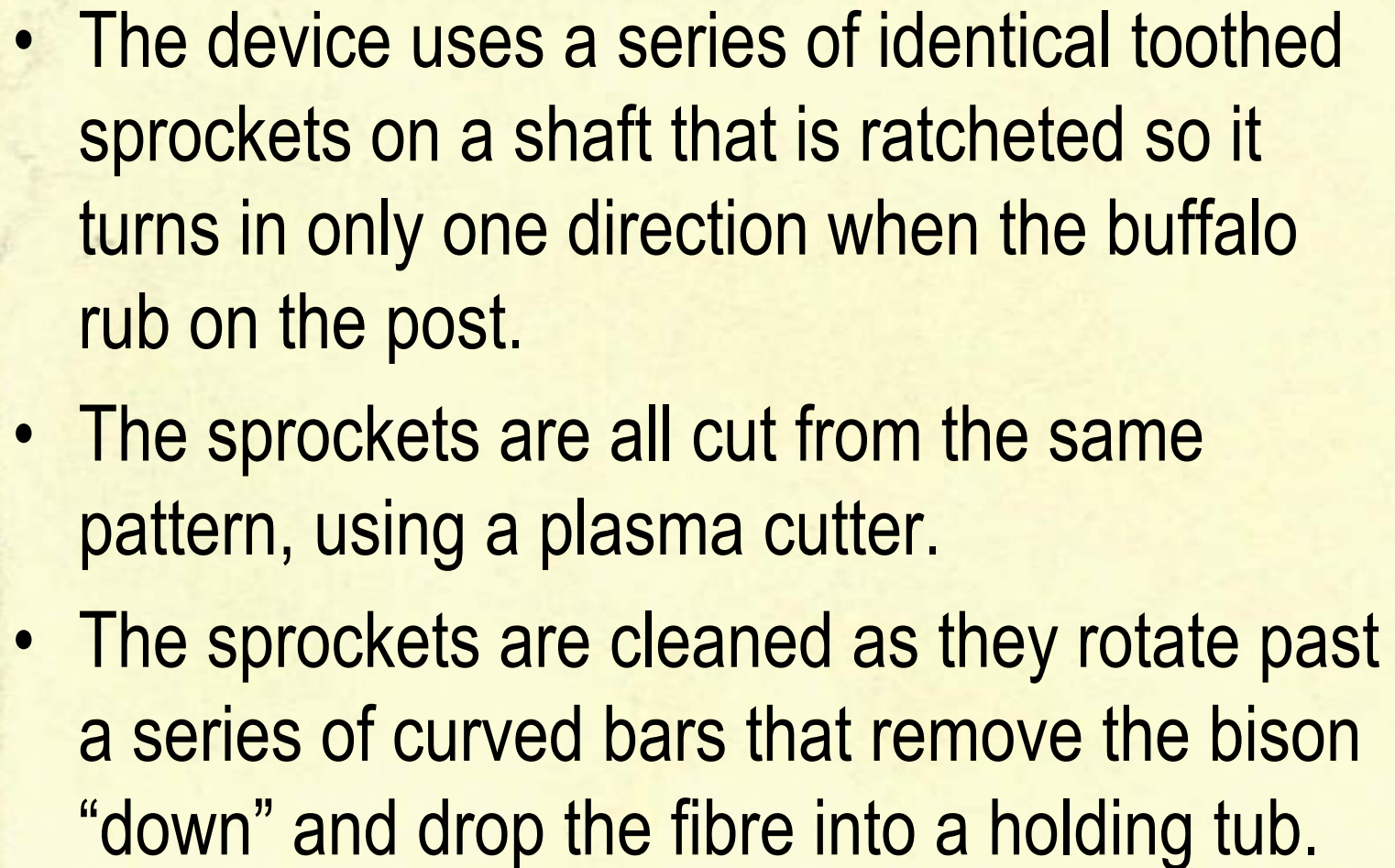
- 3-4" fingers spaced around a sleeve
- Rubber over poly rod inserted from inside post
- Fibre will be cleaned off fingers on each rotation, and fall into a collection tub, behind side panels
- May need a roof over Tub area



Prototype
of a
Collection
Device



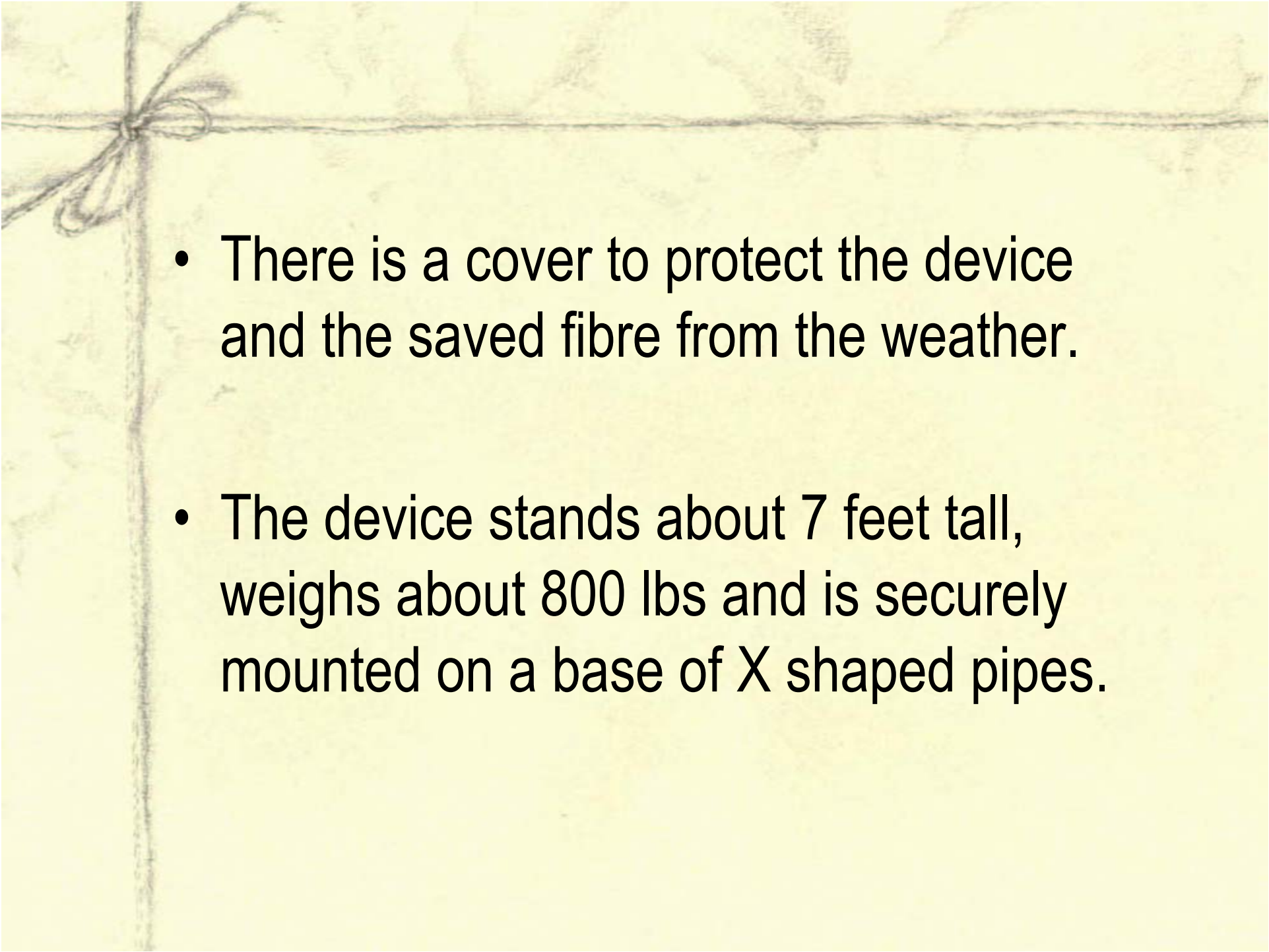


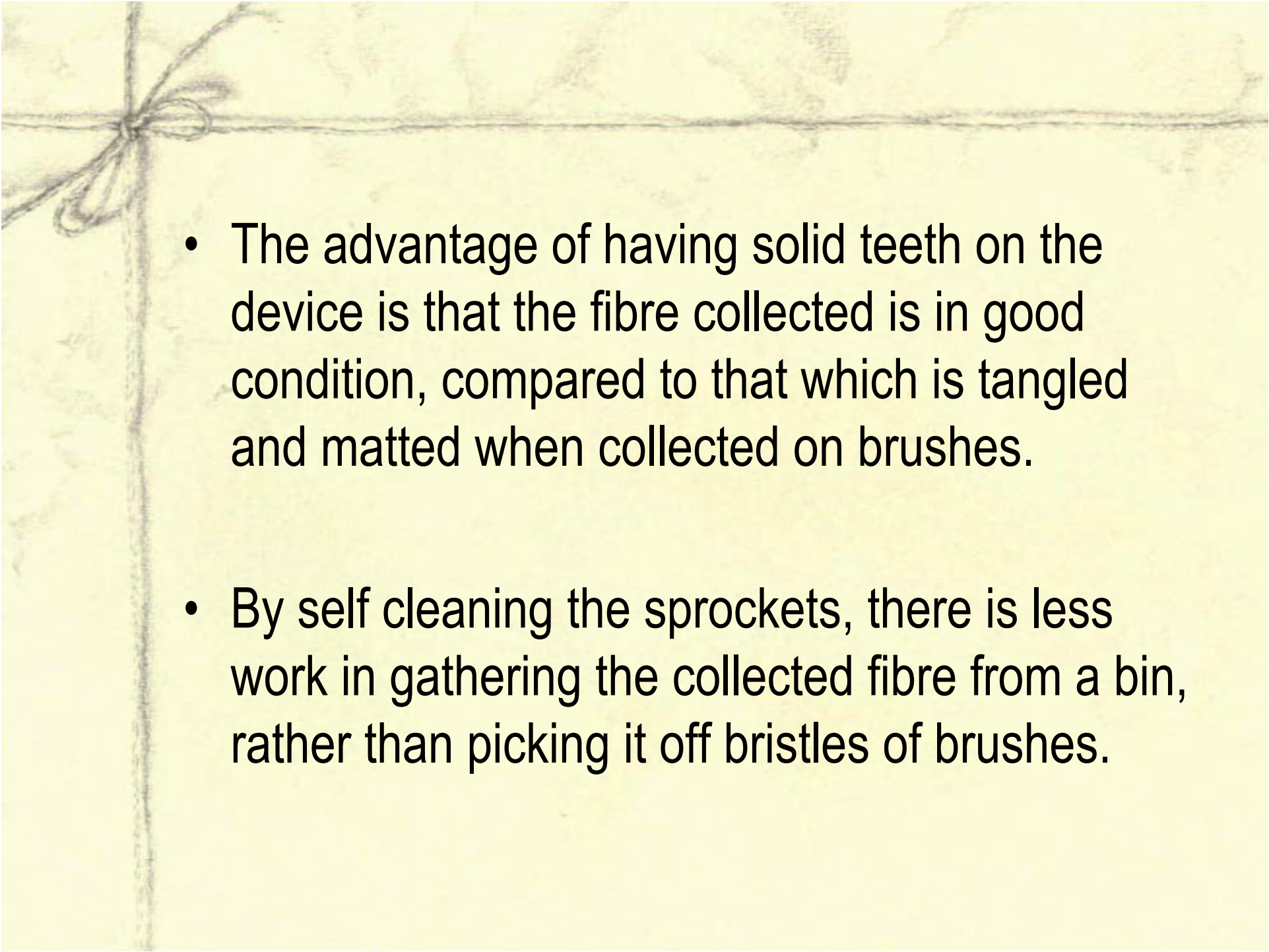
- 
- The device uses a series of identical toothed sprockets on a shaft that is ratcheted so it turns in only one direction when the buffalo rub on the post.
 - The sprockets are all cut from the same pattern, using a plasma cutter.
 - The sprockets are cleaned as they rotate past a series of curved bars that remove the bison “down” and drop the fibre into a holding tub.







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- There is a cover to protect the device and the saved fibre from the weather.
 - The device stands about 7 feet tall, weighs about 800 lbs and is securely mounted on a base of X shaped pipes.

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- The advantage of having solid teeth on the device is that the fibre collected is in good condition, compared to that which is tangled and matted when collected on brushes.
 - By self cleaning the sprockets, there is less work in gathering the collected fibre from a bin, rather than picking it off bristles of brushes.



Challenges to Developing this By-Product *(continued)*

- 1. Invention of collection device*
- 2. Perform a textile analysis of the fibre*
- 3. Organize bulk collection system*
- 4. Refine the spinning process for short fibres*
- 5. Find a “heritage” name for marketing*
- 6. Create a Marketing campaign*

Processing of “Down”



- Hand sorting - debris and dirt are picked out and coarse hairs and felted chunks must be removed
- Fibre is washed, rinsed, picked open then carded and drawn into pencil rovings, or felted into sheets

- Rovings are spun into a strand, two or more strands are plied together to form yarn
- Yarn can be woven into fabric, or knit into garments, crocheted into cushions, afghans, etc.
- Costly to process in small amounts – about \$10.00 per ounce or about \$1.50 for each step in processing
- Enhanced when blended with other natural fibres of similar micron size, such as cashmere or silk





Utilizing Short Carded Down

Prime Grade

- In situations where it is found that the cleaned fibre is too short to draw through spinning equipment, short carded fibre may be blended with another fibre which can act as a carrier to draw the buffalo fibre through spinning machinery. The choice of this carrier will determine the quality of the finished product.
- A blend of buffalo with alpaca and/or llama makes a stronger, slightly coarser yarn that is excellent for children's and men's wear such as mittens, socks, or slippers. On a finer basis, a blend with silk makes an excellent yarn for baby wear or ladies' fine garments that may be worn comfortably next to the skin.



Secondary Grade

- Short fibre can be carded into quilt batting, which makes wonderful filling for duvets and pillows. It is soft, light, and has amazing insulating properties!
- Short carded fibre can also be felted into sheets of material for sewing. Poorer grades of carded fibre, which have been discarded in the carding process, can be used for stuffing pet mattresses, or felted into horse blankets or saddle pads.



Marketing Potential

PRICE OF
RAW FIBRE

25 GRAM UNITS

Qiviut Roving	\$30.00
Cashmere Top	\$16.50
Buffalo Down	\$11.50
Baby Camel	\$ 6.30
Silk	\$ 4.50
Pima Cotton	\$ 4.25
Alpaca Top	\$ 3.00
Lambs Wool	\$ 1.90
Flax or Hemp	\$ 1.50



Fibre is sold to hand spinners - \$10.00/oz



Yarn - \$15.00/oz



Felt - \$12.00/oz



- Finished items for craft sales
- High fashion items - \$500 sweaters
- HERITAGE TOURISM eg. \$800.00 blankets





Research Project

- From experimenting with raw fibre through to a finished product, the Fibre Research Committee has identified the benefit of developing this Value Added product and the need for further research.
- The Canadian Bison Association has accepted the “Fibre Research Project” as a national objective and will coordinate further study and applications for funding. It is expected to be an ongoing project for the next 4-5 years.



Conclusion

Any form of diversification within the bison industry will enhance the reason to ranch these majestic animals, especially since bison fibre is a renewable resource and does not require the slaughter of animals.

For More Information

Please Contact:

Adele Boucher

Majestic Bison

Box 5354

Peace River AB T8S 1R9

Ph: 780-332-2554 Fax: 780-332-2540

Email: aboucher@telus.net

***Website: [www.bisoncentre.com/resources/
bce255/about_bison_fibre.pdf](http://www.bisoncentre.com/resources/bce255/about_bison_fibre.pdf)***

Designed by:

