

Alpaca and Llama Teeth: Trimming Teeth with a Dremel or OB Wire

By Eric Hoffman

For many camelid owners teeth trimming is a procedure left to their veterinarian. But, for some experienced owners it is a task they do on their own. Regardless of who cuts the teeth, tooth trimming is routine herd health necessity, along with toe nail trimming and inoculations. The primary purpose of this article is to discuss methods commonly employed to trim teeth, with insight into aspects not commonly discussed. Regardless of the method employed, the correct technique is essential to complete the task without traumatizing or injuring the animal. Before we discuss teeth trimming tools and methodology let's review camelid dentition.



Evolution of Camelid Teeth

Both llamas (whose progenitor is the guanaco), and alpacas (whose progenitor is the vicuna) have inherited their dentition from their wild ancestors. The dental layout and specialization of teeth found in llamas and alpacas is evident in 25 million year old ancestral camelids displayed in the Smithsonian Institution in Washington D.C. It's safe to say the evolution of camelid teeth has been underway for millions of years. Llamas and alpacas have the same number and kinds of teeth (same dental formula): molars, incisors and canines.

For this discussion the significant

difference between the two species is that in llamas the incisors (front teeth) are encased in enamel and are not prone to continue growing throughout the animal's lifetime. However, many llamas are still in need of tooth trimming. Alpacas teeth have characteristics of both llamas and vicunas; they usually have no or little enamel on the tongue side of their teeth and experience continual tooth growth well into adulthood.

Functions of the Different Kinds of Teeth

Incisors: The incisors are designed to procure food. The llama or alpaca grabs a tuft of grass growing from the ground and shuts its mouth on it, pressing the grass against the dental pad (front of top jaw) with its incisors (teeth at the front of the lower jaw). With the grass held firmly, the animal tears it away and eats.

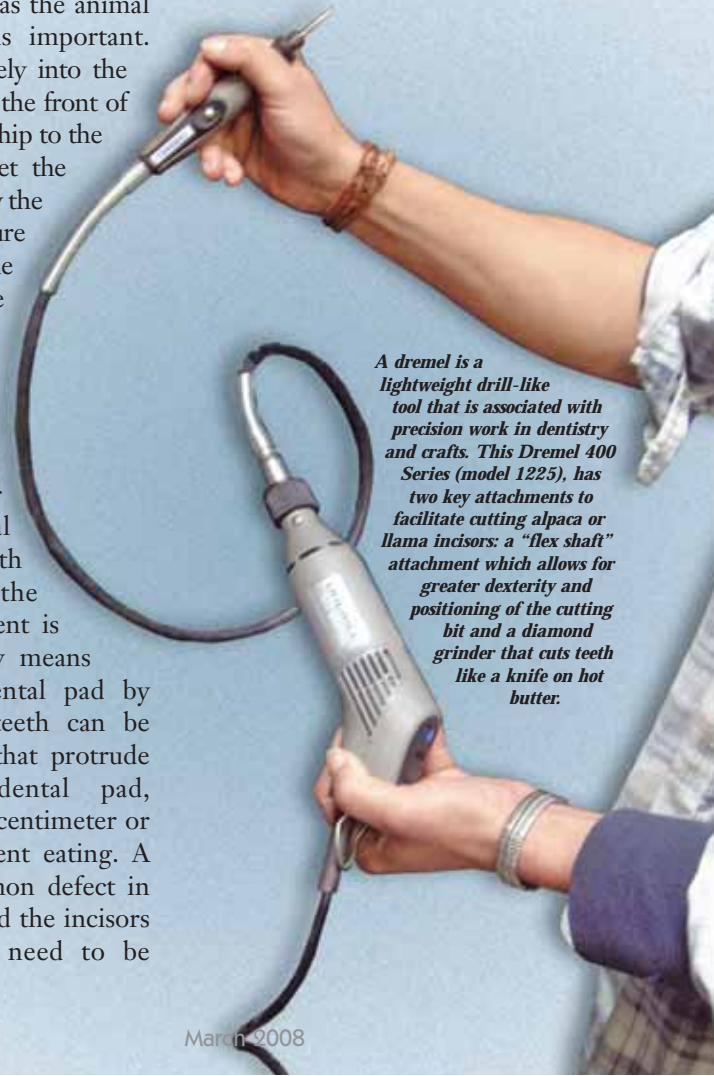
In a normal animal there are six incisors at the front of the lower jaw (mandible) and no front teeth at front of the upper jaw (maxilla). The incisors are deciduous, meaning they will be shed and replaced by permanent teeth at fairly predictable intervals as the animal ages. Incisor alignment is important. Incisors should close squarely into the bottom of the dental pad at the front of the upper jaw. The relationship to the incisors and how they meet the palate defines how efficiently the animal will be able to procure food in environments like the vast puna where they have evolved.

A llama or alpaca with correct dental alignment of the incisor teeth (with the dental pad of the maxilla) will gradually wear them down with normal chewing motion as the teeth come in contact with the dental pad. If the alignment is not good, which typically means the incisors miss the dental pad by protruding past it, the teeth can be expected to grow. Teeth that protrude excessively past the dental pad, sometimes missing it by a centimeter or more, do not allow efficient eating. A long lower jaw is a common defect in both alpacas and llamas and the incisors protruding from it will need to be trimmed periodically

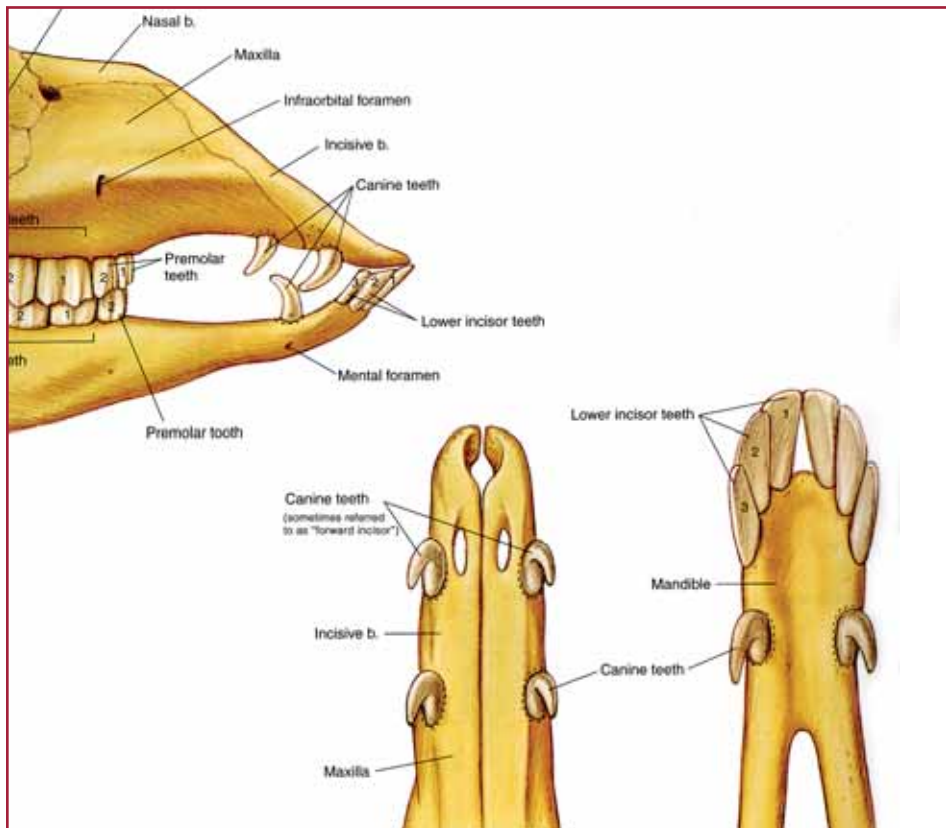
Molars: There are six molars on each jaw (3 per side) plus premolars. These large grinding teeth are essential to the digestion of food and are found at the back of the mouth. Molars function to pulverize food before it is swallowed and are vigorously used when the animal chews its cud of material brought up from its stomach.

In younger animals molars are rarely a cause for concern. However, in older animals periodontal disease, tooth abscesses and uneven wearing can severely impact an animal's ability to eat properly. Failing molars affect survivability. More attention is being paid to molars as the population of geriatric animals grows in North America. Molars are difficult to work on, even for the seasoned veterinarian, because they are at the back of a camelid's mouth and the mouth does not open wide. If a problem related to the molars is suspected, a radiograph is usually the best way to evaluate it.

In some instances wear and tear on molars results in molars with jagged tops



A dremel is a lightweight drill-like tool that is associated with precision work in dentistry and crafts. This Dremel 400 Series (model 1225), has two key attachments to facilitate cutting alpaca or llama incisors: a "flex shaft" attachment which allows for greater dexterity and positioning of the cutting bit and a diamond grinder that cuts teeth like a knife on hot butter.



Close up of diamond grinder No 562, which works well for cutting and beveling camelid teeth. Choosing the correct cutting device is essential to successfully cutting teeth. If the wrong head is used the cut may take an inordinate amount of time, chip the teeth and cause undue stress to the animal and undermine the integrity of its teeth. Also prolonged cutting makes restraint more difficult as the animal fights to avoid discomfort. The selection of the correct cutting bit is extremely important for animal welfare and precision work.

and poor grinding motion. In other cases uneven surfaces are ground (or flattened, or floated) to bring greater compatibility to how molars fit together when they grind food. Molar abscesses are also challenging. In the 2007 International Camelid Health Conference Proceedings held at Oregon State University, Michael Huber DVM, Dipl. ACVS presented a paper that explains combinations of surgery and antibiotics used to deal with abscesses. Dr. Huber stressed that success is directly related to early detection.

Canine Teeth: The canine teeth, also known as fighting teeth, are present on all adult male alpacas and llamas. They are found in the jaw between the incisors and the molars. While not present at birth they usually begin emerging around 24 months, but may not fully emerge until seven years in some animals. Adult females also have canine teeth which are not usually prominent. They are seldom cause for concern due to the temperament of females, and the fact that their canines often barely protrude above the surface.

There are two canine teeth on each side of the maxilla (upper jaw), and one canine on each side of the mandible (lower jaw),

making a total of three per side. Fully erupted, these teeth curve backward, are razor sharp, and are designed to lacerate an opponent during a fight. In males, canines can measure an inch (2.54 cm) in length. Serious and permanent injuries can be expected if canines are not removed. The teeth are larger on males than females, larger yet on male llamas (and like railroad spikes in Dromedary camels). Because males bite when they fight common injuries are torn or severed ears, permanently damaged tails, lacerated testicles and permanent leg lameness due to severed tendons and ligaments.

Cutting Incisors: Cutting incisors involves more factors than one might imagine. With incisors, the cut should be where the teeth would touch the dental pad if they were the correct length and alignment. Incisors neglected for a long period of time can be quite long and protrude from the animal's face. Such teeth are unsightly, and less efficient for collecting food than correctly aligned teeth. They are also more prone to breaking off, due to the increased leverage at the end of the tooth as it lengthens. Even teeth that aren't neglected can become quite thick and difficult to cut, especially in older animals.



Based on a quick visual inspection Silke Herrling of Wittmund, Germany selects a likely candidate for an incisor trim.

The first challenge is to restrain the animal in a safe manner that allows the head to be controlled. This can be done by employing two people to hold the animal (one on the body and the other on the head) or by using a correctly configured restraining chute with quick-release halter restraints should something go wrong.



To accurately assess incisors for trimming the lips must be peeled back to see where the cut should be made to best fit into the toothless upper palate.



Cutting should be done in one pass. It's important to make the cut that will allow the teeth to come as close as possible to meeting the palate. Drawing a "cut line" on the teeth with a felt tip pen with the mouth closed works best to precisely mark the cut, which will occur when the mouth is held open.



Cut begins: The mouth is held open with a strategically placed portion of a broom handle (one-half inch PVC pipes works well too) and a gloved hand is used to further restrain and isolate the teeth from surrounding soft tissue. In this way the soft tissue around the cut site is well protected.

Deciding where to make the cut is most accurately assessed when the mouth is shut with the lips lifted to view how far the teeth protrude past the palate. While the mouth is closed the cut line can be accurately marked directly onto the teeth with a felt tip pen. The line should be drawn so the post-cut profile of the teeth touches the pallet.

Regardless of the cutting instrument, (dremel or OB wire) precautions must be taken to safeguard the gums, lips and pallet from the cutting instrument. A high speed tool like a dremel with a diamond cutter can do a great deal of damage to soft tissue.

The mouth must be held open so the cut does not inadvertently involve the upper palate, tongue or the lips. There are several ways to keep the mouth open throughout the procedure. A cylindrical shaped section of one-half-inch PVC pipe, one-inch thick section of rope, or even a section of wooden broom handle can be slid to the back of the mouth and gently, but firmly held in place. This forces the mouth open for the duration of the procedure. Some handlers merely stick their thumb into the mouth directly behind the incisors, but this is dangerous especially if the canine teeth are still present. A lacerated thumb may be the outcome if an animal jerks its head forward or a handler misjudges where the canines are located.

I've always cut incisors using OB wire. If done properly four incisors (the usual number needing cutting, even though

there are six) can be cut in less than a minute. The idea is to set the wire. Make sure soft tissue (tongue, gums, lip) is not in jeopardy and work the wire back and forth until the teeth are cut. Finesse is required as pulling too hard may dislodge a tooth. A fresh section of wire will cut rapidly with only mild pressure, providing the cutting stroke is consistent.

To cool the cut (there is heat generated by the cutting motion), water from a 60ml syringe can be dribbled onto the teeth while the cut is being made. Thick teeth on older animals are more difficult to cut and care must be taken in assessing how much to cut as the tooth's pulp may extend farther into the tooth and be exposed by a cut. A cut done with OB wire will leave a sharp ridge along the edges of the teeth, requiring light filing. Some veterinarians administer a sedative for tooth cutting.

Cutting Canines (or fighting teeth)

For a time veterinary schools attempted to surgically remove canines. The procedure proved to be difficult, and hazardous to the animal because of the root structure of the tooth and its relationship to the jaw. It is also expensive. Although some schools and surgeries may still do this, most field veterinarians cut canine teeth at the gum line, with very few problems occurring.

There are several aspects of cutting canines that deserve mention. First, canines are further back in the mouth than the incisors and more difficult to



After the cut is made there is usually a sharp edge on the tooth ridge. This edge should be beveled to make it dull and more comfortable for the camelid to run its tongue over.



When the cut and beveling are completed the mouth is closed again to assess the quality of the fit between the incisors and palate. In this case the fit is excellent and will allow this alpaca to ingest food efficiently.



An ear cut in half as a result of males fighting with fully erupted canine (fighting) teeth. Disarming canines in males is a necessity of good alpaca or llama husbandry.



Canine, or fighting teeth, are designed to injure an opponent in a fight. Removing them is essential to male camelid management. These teeth can cause serious injury if they aren't cut properly. The canines are further back in the mouth and more difficult to reach than the incisors. OB wire (an abrasive wire specially designed to cut bone, shown above) works well to cut a canines. It fits into the narrow difficult-to-access area where the canines are located. Once the wire is slipped over a canine tooth the cutting only takes seconds, usually two to four strokes cuts through the tooth. Care must be taken make the cut entirely on the tooth without involving the soft tissue. The person making the cut must be mindful of cutting parallel to the gum line regardless of the angle in which the animal's head is presented.

reach. Second, cutting them with OB wire is relatively easy once the wire is looped around the back of the tooth. Third, the teeth may be sharp but they are thin. Because they are so thin it usually takes only a few strokes back and forth using an OB wire to cut the tooth. Fourth, for the person new to cutting canines, it is very important that the cut is made parallel to the gum line so the cut does not involve touching the gums. Plus, the lips need to be held open and away from the cutting surface.

Lastly, canines may need to be cut more than once. Often they are cut when they first emerge and the owner is surprised when the animal injures another animal a year or so later. This is because the canines were not fully erupted when they were first cut. They kept growing and became dangerous. The wise owner checks on the status of canines in two to seven year-old males on an annual basis.

Outfitting a Dremel

Dremels (small hand held electric (or battery) powered drills, often associated with dentistry and precision crafts) are preferred by many veterinarians and owners. I've witnessed numerous dremels used with varying degrees of efficiency. The dremel's capability, the user's skill and, most of all, the type of bit employed are very important.

During a recent trip to Germany I

visited a large alpaca farm owned by Mike and Silke Herrling near the North Sea in the tiny town of Wittmund. I had heard from German veterinarians that Silke was a master at cutting teeth and asked to see how she did this.

Silke's tooth trimming skills, with a carefully outfitted dremel, were impressive. She and her 16 year old daughter Alex worked through animals quickly and were able to contour their cuts and bevel edges of teeth. The cuts were precise and oddly twisted teeth were handled individually. Her dremel was a 400 Series XPR tool with a FlexShaft (Model 1225). The flex shaft, which attaches to the dremel's shaft, allows for a great deal of flexibility. This gives the user the ability to approach teeth from radically different angles without moving the animal's head or the cutter's standing position in front of the animal.



In addition to the dexterity allowed by the flex shaft, Silke feels the correct bit is extremely important. She talked to veterinarians and experimented with cutters before settling on the tile cutting Bit No. 562 with a diamond grinder. This bit cuts teeth like a hot knife in butter and is precise without appreciable vibration or chafing.

Silke explains in perfect English: "This tool is excellent for cutting teeth, but the user needs to respect that it is a high speed tool. Every care should be taken not to touch soft tissue when using it. If the user is cautious in this way they will be very pleased with the result and the animals will benefit from an experience that only last a few minutes." She felt her dremel was superior in capability to OB wire for incisors but felt OB wire had some advantages in cutting canine teeth.

For more on dremels, attachments and bits contact: www.dremel.com/en-us I offer the particulars on Silke's dremel and its attachments not so much as an endorsement, but as a starting place and point of comparison, should you decide to acquire a dremel.

CAUTIONARY NOTE:

The author recommends camelid owners contemplating cutting teeth first consult their veterinarian and work with a veterinarian to learn the art of making cuts before trying it yourself.

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About the Author

Eric Hoffman is the primary author of the second revised edition The Complete Alpaca Book, (Bonny Doon Press, 2006). He wrote the first scientifically based alpaca registry (today known as ARI) in the world and is author of hundreds of articles on all four species of camelids. His articles have appeared in International Wildlife, Animals, Pacific Discovery, California Living, Wildlife Conservation and many other publications. His speaking engagements on camelids have taken him to many places including Canada, Australia, New Zealand, Sweden, Switzerland, Peru, Germany and England.