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## **Evaluating Teeth to Estimate Cattle Age**

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### **Introduction**

Cattle age information is useful in both cattle management and marketing. Age affects cattle value. Both replacement and market cows typically decline in value with advancing age. When possible birth records should be kept on cattle and follow them as they move from one operation to another. In this way, the exact ages of animals will be known. When cattle age records are not available, dentition may be used to estimate cattle age.

### **Dental Anatomy in Cattle**

Dentition is the development of teeth within the mouth. Cattle have 3 major teeth types: incisors, premolars, and molars. The incisors appear toward the front of the mouth and only on the bottom jaw of cattle. The front of the upper jaw is a hard dental pad without teeth. The premolars appear adjacent to the incisors on the sides and further towards the rear of the mouth. Moving further towards the rear of the mouth, the molars appear adjacent to the premolars. The premolars and molars are together known as cheek teeth.

Cattle first develop 20 temporary teeth, known also as deciduous, milk, or baby teeth. These temporary teeth eventually fall out and are replaced with 32 permanent or adult teeth as an animal matures. Temporary teeth are much smaller in size and whiter in color than permanent teeth.

Cattle develop 8 temporary incisors that are later replaced by 8 permanent incisors. The central pair of incisors is called the pinchers. Immediately next to the pinchers, the second pair of incisors to develop is the first intermediates or laterals. The third pair of incisors is also known as intermediates or laterals. They develop next and adjacent to the previous pair of intermediate incisors. The final pair of incisors develops to the outer sides of the previously erupted incisors. This fourth pair of incisors is called the corners.

Among the temporary teeth, there are 12 premolars, 3 on each side of the upper and 3 on each side of the lower jaws. Similarly, mature cattle have 12 permanent premolars. There are no temporary molars, only permanent molars. As with the permanent premolars, cattle develop 12 permanent molars. Three permanent molars appear on each side of the upper, and another 3 molars appear on each side of the lower jaws.

### **Tooth Development and Wear**

Incisor eruption occurs in a distinct pattern over time and provides information about the approximate age of an animal. At birth a calf typically has 2 or more temporary incisors erupted through its gums, although some calves are born without any incisors visible. Temporary incisor eruption occurs rapidly in the newborn calf. By the time a calf is a month old, all 8 temporary incisors generally appear.

The permanent pinchers appear at 18 to 24 months of age and are fully developed in 2 year-old cattle. They are followed by the appearance of the first intermediate pair of incisors at 24 to 30 months of age. Full development of the first intermediate pair of permanent incisors happens by the time an animal is 3-years old. The second permanent intermediate incisor pair erupts when an animal is around 3-years-old, with full development occurring at 4 years of age. The last set of permanent incisors to erupt are the corners, which debut at 42 to 48 months of age and are fully developed by the time an animal turns 5-years old. The eruptions of all the permanent cheek teeth take place in the first 3 years of an animal's life.

The permanent pinchers generally become leveled in cattle between the ages of 5 to 6 years. They commonly show noticeable wear by the time cattle reach 7 to 8 years of age. The first and second permanent intermediate incisor pairs level at 6 to 7 and 7 to 8 years of age, respectively. Noticeable wear is evident in these lateral pairs by the time cattle are 8 to 10 years old. The corners normally level in 9 year-old cattle and show obvious wear in 10-year old cattle.

Age determination of cattle up to 5 years of age based on incisor eruption and development is more accurate than age estimation based on dental wear for older cattle. Relatively coarse or gritty feedstuffs in cattle diets accelerate tooth wear. In addition, the genetics of individual cattle can impact their susceptibility to tooth wear and loss. Crossbred cattle often maintain their incisors longer than straightbred cattle, and Brahman-influence cattle may have an advantage in keeping their teeth over other breeds. General age guidelines based on dentition are best adapted to the local conditions by referencing the dentition of cattle of known age under those conditions and modifying the guidelines to fit the cattle and their environment.

The necks of teeth near their bases become narrower as teeth wear. Gaps begin to appear and widen between teeth, and teeth take on a more triangular shape above the gum surface. As tooth wear continues, the roots of teeth may become exposed. Teeth may loosen in their sockets and later fall out of the mouth entirely. Cattle with broken or missing teeth are called "broken-mouth" cattle.

Another noticeable aspect of tooth wear is that the initial arch of a tooth eventually flattens with wear. Teeth wear down over time towards their bases at the gum line. A "short-mouth" animal has experienced significant tooth wear in which teeth are noticeably shorter and smoother than before but are not yet worn down to the gum line. It is reasonable to assume that a "short-mouth" cow is 8 years old or older. Extreme wear finally results in very short, tooth stumps known as "peg teeth". In a "smooth-mouth" animal, all of the incisors are either missing or worn down smooth to the gums. This condition is also referred to as being a "gummer".

Another indication of tooth wear is the loss of enamel and exposure of dentin. Enamel is the hard white outer protective coat of a tooth. Dentin is the soft inner core of a tooth. It is much darker in color than enamel, often appearing in varying shades of yellow. Dentin becomes more apparent as tooth wear progresses over time. A dental star is the dentin in the pulp cavity of a tooth that appears at the biting or chewing surface of a tooth as it wears. Dentin becomes visible as a circular or star-like shape surrounded by enamel.

Dental stars are typically seen in the pinchers and intermediate incisors in cattle around 10 to 12 years of age and in the corners at 13 years of age. Age estimates based on visible dentin are general guidelines and vary depending on the individual animal and its environment.

### **Dentition Affects Cattle Value and Productivity**

It is recommended to routinely examine the teeth of cattle to identify serious dental problems. Bad teeth are among the most common reasons cows are culled. Poor-mouthed cattle may require treatment or diet modifications to remain productive or otherwise need to be marketed for harvest.

Without proper dentition, an animal may not be capable of consuming adequate nutrients to maintain acceptable body condition or weight. Broken, missing, or heavily worn teeth may cause an animal to excessively dribble feed from its mouth or have difficulty harvesting forage during grazing or grinding forage during rumination. Dental problems that affect forage and feed consumption may be suspected in cases of rapid loss of body condition and weight relative to other cattle in the herd.

A “solid-mouth” animal has no broken or missing teeth. “Solid-mouth” may also refer to a lack of noticeable gaps between teeth. The value of solid-mouth cattle is generally greater than that of comparable cattle with more advanced dental wear because of an expectation of a longer remaining productive life in the cattle with better overall dentition.

### **Handling Cattle for Teeth Inspection**

When inspecting an animal’s teeth, use proper cattle restraint and handling procedures. Handlers may become injured by a sudden head movement if not careful in handling the animal. Start by restraining the head in a head catch. It may be useful to further restrain the head with a mechanical device attached to head catch that extends the neck of the animal to the side or by using a halter to secure the animal’s head. If nose tongs are applied, use caution in case they suddenly slip out of the animal’s nose.

Pry the mouth open by placing one or more fingers inside the corner of the mouth behind the teeth. Then grab the animal’s tongue and pull it to one side to hold the mouth open. This will minimize the risk of being bitten during inspection of the animal’s mouth and teeth.

### **Additional Information**

A YouTube video is available on the MSUBeefCattle YouTube channel showing the process of estimating cattle age using dentition. Go online to [www.youtube.com/user/MSUbeefcattle](http://www.youtube.com/user/MSUbeefcattle) to view this narrated video. For more information about beef cattle production, contact an office of the Mississippi State University Extension Service or visit [msucares.com/livestock/beef](http://msucares.com/livestock/beef).