

# Technical Aspects of Determining Over-Age in Beef Cattle

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## Introduction

In most textbooks in regards to determining the age of a bovine animal, there is a wide variation in the tooth eruption schedule in relation to age. After many years of experience in examining the teeth of young beef cattle by the author in collaboration with other veterinarians\* who have spent considerable time and effort in determining age, it is their consensus of opinion that stress from nutrition, environment, or disease cause 97% of the variation of eruption and growth of young beef cattle teeth. If conditions of (1) no stress from nutritional deficiencies, (2) optimum weather conditions, and (3) freedom from all disease and illness are available, the maximum normal development of teeth is very uniform and can be utilized as a standard for determining "over-age" of beef cattle in the show ring with a high degree of accuracy under thirty-eight months of age.

## Method

From eight months through thirty-eight months there are 29 distinct eruption changes used in the system that most experienced veterinarians\* use. In addition, there are other indicators used to complement eruption changes. In cases where bilateral teeth do not erupt or develop at the same time, or when one tooth of a pair develops at a different rate from its opposite, the reading is based on the one with the minimum development.

Visual inspection of premolars and molars varies some from observations of incisors. Due to the manner in which the premolars and molars erupt and develop, readings are taken from the posterior lingual area of the molars involved.

Attention is directed to the spread in age between various eruptions. When there is a spread of two months there are additional indicators noted by experienced veterinarians to determine a more exact breakdown in age. Age determining levels for "in between" eruption development are

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(1) positioning of the tooth, (2) wear and grooves, (3) referral to previous tooth pairings, (4) spacing between teeth at gum line, and (5) close observation of the gum condition as well as (6) coordination of all three areas (incisors, premolar and molar) of eruption activity and degree of maturity of the tooth.

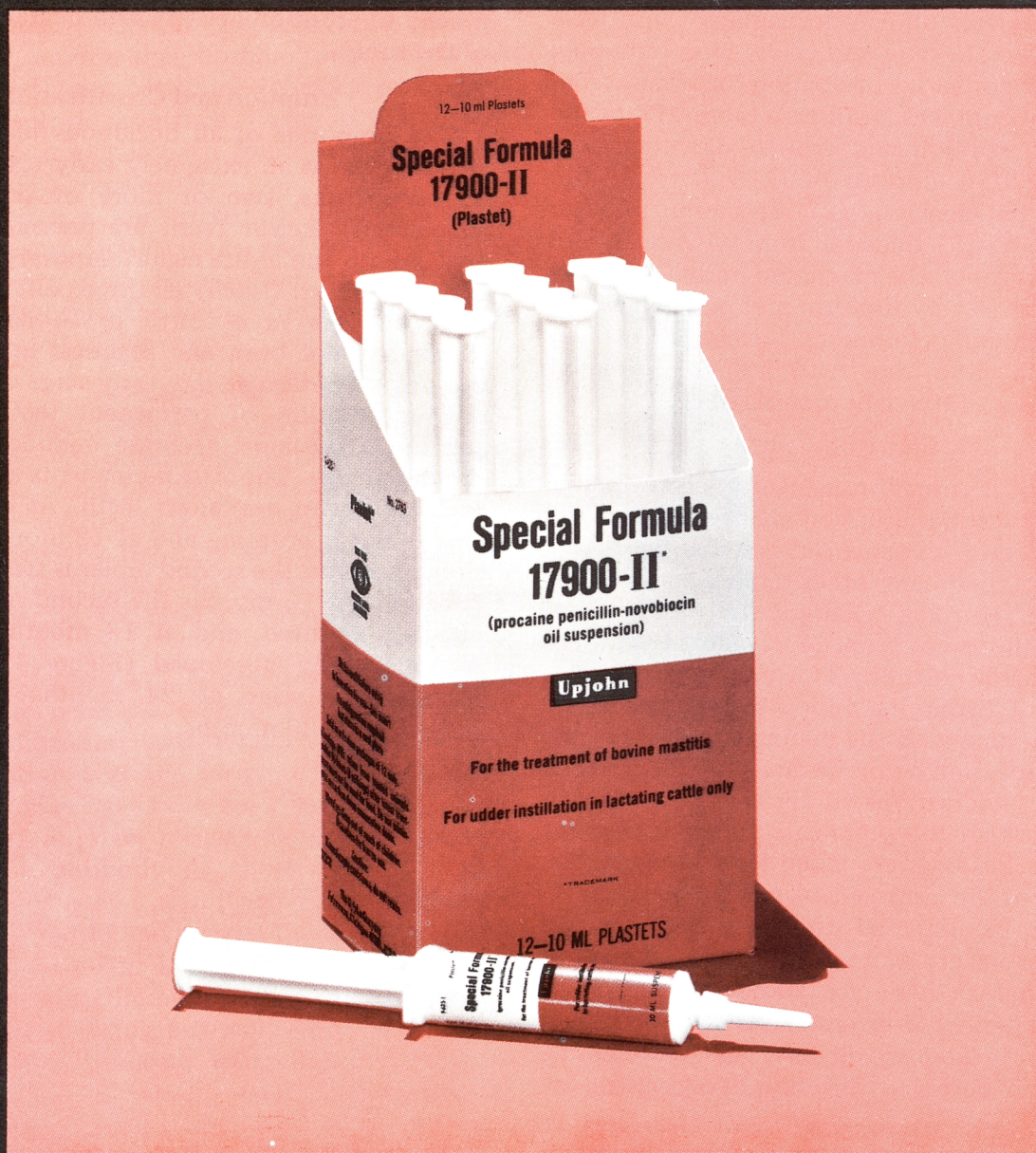
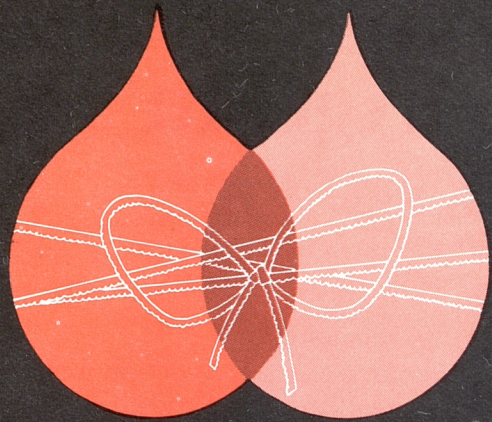
## Eruption and Classification

The eruptions of all deciduous teeth in young calves occur at an extremely early age. From birth to two weeks, two or more of the temporary (deciduous) incisor teeth are present. Within the first month the entire eight temporary (deciduous) incisors appear. Usually all three pairs of deciduous premolars are in at birth or shortly afterward. There has not been any practical application for age determination at this early stage of bovine life.

The eruption of permanent teeth at various periods is the most accurate method available to determine age. The first permanents are the molars which have no deciduous teeth. At 8 months the first molar is erupting and at 12 months it is fully developed and the second molar is starting to show eruption. At 15 months the second molar is about one-half matured, and at 18 months the second molar is fully developed (Figure 1). The third molar is erupting at 24 months and is fully developed at 30 months.



Figure 1. Upper and lower  
1-1st premolar; 2-2nd  
5-2nd molar; and 6-3rd



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The permanent premolars are replacing the deciduous premolars starting at 18 months with the second (middle) permanent premolar erupting. At 24 months the first permanent premolar is erupting while the third premolar appears at the gum line at 30 months.

To illustrate a partial breakdown in the eruption schedule of a normal bovine's incisors, the following drawings show the maximum limits of incisor development as related to actual age:

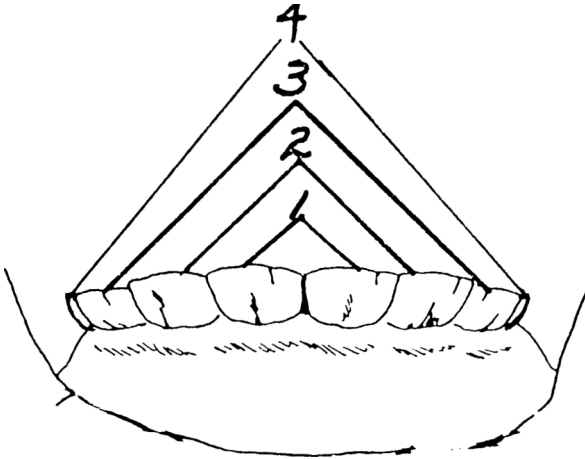


Figure 2. Maximum development for 18 months. All four pairs of deciduous incisor teeth firmly in place. Note: 4th pair is hidden by 3rd pair. 1-Central incisors or pincers; 2-First intermediates; 3-Second intermediates or laterals; 4-Corners (hidden).

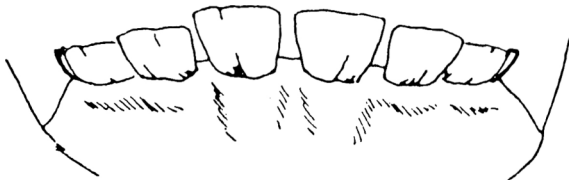


Figure 3. Maximum development for 19 months. First deciduous pair of incisors are beginning to raise due to pressure exerted by the 1st pair of permanent incisors developing up through the gum.

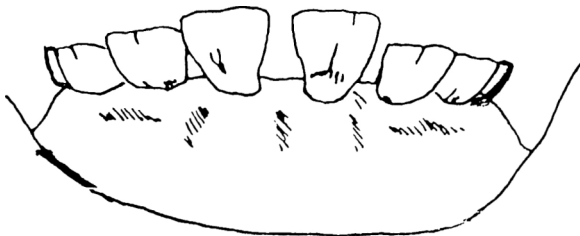


Figure 4. Maximum development for 20 months. Medial pair of deciduous incisors narrowing at the gum. Pressure from 1st pair of permanent incisors will force the deciduous first pair to drop out in approximately two weeks.



Figure 5. Maximum development for 20½ months. First pair of permanent incisors (centrals) are starting to erupt. The first pair of deciduous incisors have dropped out. There is intense inflammation of the gum area adjacent to the eruption.

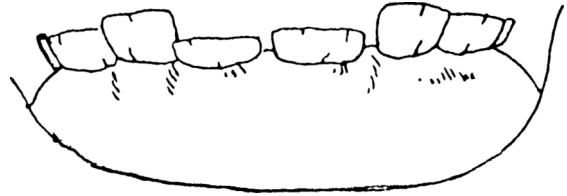


Figure 6. Maximum development for 21 months. First pair permanent incisors erupted, one-fourth of full maturity. Moderate inflammation at gum area of eruption.



Figure 7. Maximum development for 22 months. First pair of permanent incisors are one-half matured. Note gum line is still showing some inflammation.

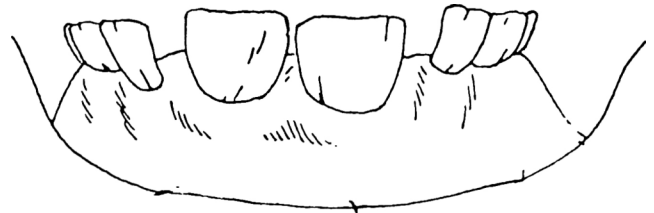


Figure 8. Maximum development for 23½ months. First pair of permanent incisors fully matured. No inflammation present.

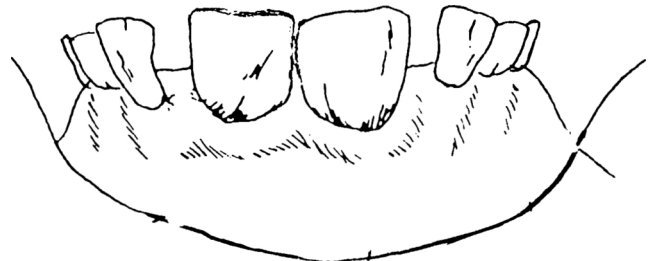


Figure 9. Maximum development for 25 months. First pair permanent incisors fully developed and second pair of temporary incisors showing receding at the base of gum line.

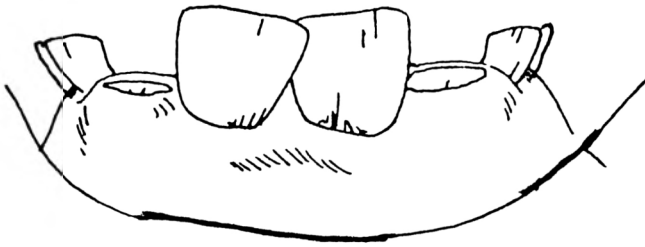


Figure 10. Maximum development for 26½ months. First pair permanent incisors fully developed. Second pair permanent incisors are starting to erupt through a very inflamed gum. Note the second pair of deciduous teeth have dropped out.



Figure 11. Maximum development for 27 months. Second pair permanent incisors have developed one-fourth of maturity. Moderate inflammation surrounding gum area of newly erupted second pair.

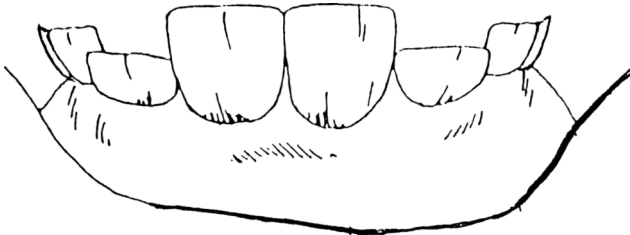


Figure 12. Maximum development for 27½ months. Second pair permanent incisors developed one-half of potential. Inflammation has resolved.

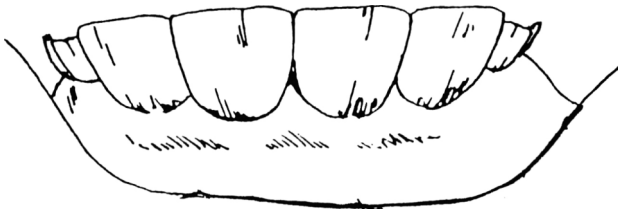


Figure 13. Maximum development for 29½ months. Second pair permanent incisors fully developed. Third deciduous incisors beginning to recede at the base adjacent to the gum.

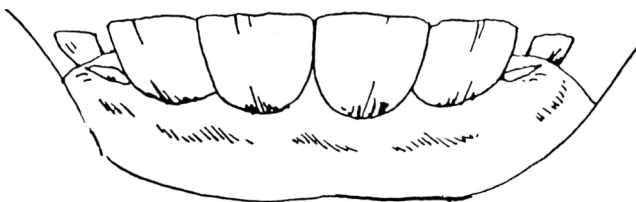


Figure 14. Maximum development for 31 months. First and second pair permanent incisors fully developed. Third pair permanent incisors starting to erupt with intense inflammation in adjacent area.

### Variables of Underdevelopment

Retardation of permanent teeth by bad weather, poor feed, and chronic disease will delay eruption

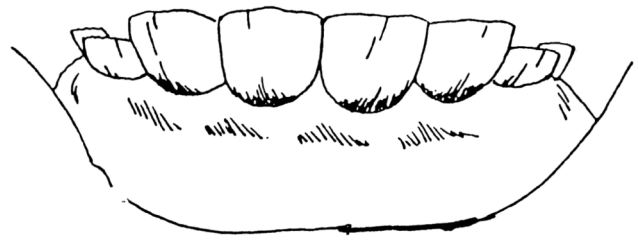


Figure 15. Maximum development for 32 months. Third permanent incisors are one-half developed. Inflammation has been resolved in adjacent gum area. Note fourth deciduous pair of incisors are firmly in place.

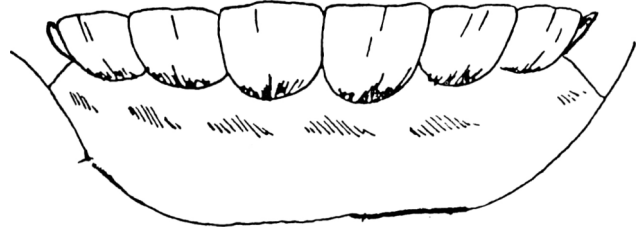


Figure 16. Maximum development for 34 months. Third permanent incisors fully developed. Fourth deciduous incisors starting to recede and will drop out at 36 months, after which the fourth permanent incisor will start erupting.

of permanents by three to six months and in severe cases up to one year. A calf that has a poor milking mother may have a delayed tooth development of three to six months. Calf pneumonia or diarrhea of chronic duration may cause four to five months' delay in permanent tooth eruption. Calves that are exposed to unusual extremes of weather (drouth, cold, hot, etc.) will not have teeth develop in a normal manner. A calf or yearling exposed to unbalanced ration or insufficient carbohydrates for several months will show a severe delay in permanent teeth eruption schedule. Retardation of normal tooth development due to stress is so prevalent that in major steer shows, twenty-five percent of those exhibited will have some degree of retardation; in major purebred breeding shows approximately ten percent of the young cattle shown exhibit retardation. The author suspects that in normal average range cattle, fifty percent of the calves will have suffered some stress to cause delayed eruption to some degree.

Fortunately, in the show ring and perhaps the bull test stations, veterinarians are usually asked to determine "over-age" only. When one is requested to determine actual age or under-age, the accuracy is extremely disappointing due to stress factors in the past history of the cattle being unknown.

Again, it should be emphasized to all veterinarians who are requested to render services of age determination, to respond by determining over-age only, if accuracy and integrity is desired by all involved.