

Introduction

This guide describes how the teeth of culled deer can be used to help confirm the age class of culled animals. It links to the Assessing age guide which should be regarded as important companion reading.

Accuracy

Estimates of age can be based on both tooth eruption patterns and tooth wear. The progress of tooth eruption in young deer is accurate to within a month or so. For adults tooth wear must be used. It is less accurate but can at least indicate the age class, if not the specific age in years. Where locally obtained known-aged jaws are available to allow comparison, it may be possible to make more detailed estimates of age using wear. Accuracy is also improved if the jaw is removed and examined as a dry specimen but estimates carried out on the fresh carcass may be adequate for most purposes.

Alternative methods such as sectioning teeth to examine cement layers (equivalent to age rings in trees) are available but can be laborious and difficult to interpret.

Which teeth

The “cheek teeth” i.e. the pre-molars and molars in the lower jaw are most used in estimating age because they are the most accessible and yield the most information. It is worth checking that both sides of the jaw are similar as there can be differences, especially in adult tooth wear.

Tooth eruption

Deer are born with three deciduous (milk) pre-molars (pm i, ii, iii), these are eventually replaced by permanent teeth as the animal becomes an adult. pmiii has three cusps, making it very different from the adult PM3 that will replace it.

The first adult tooth to appear is molar 1 (M1) which is followed by M2 and M3 then PM 1,2,3 which appear in rapid succession as they push out the milk pre-molars from below.

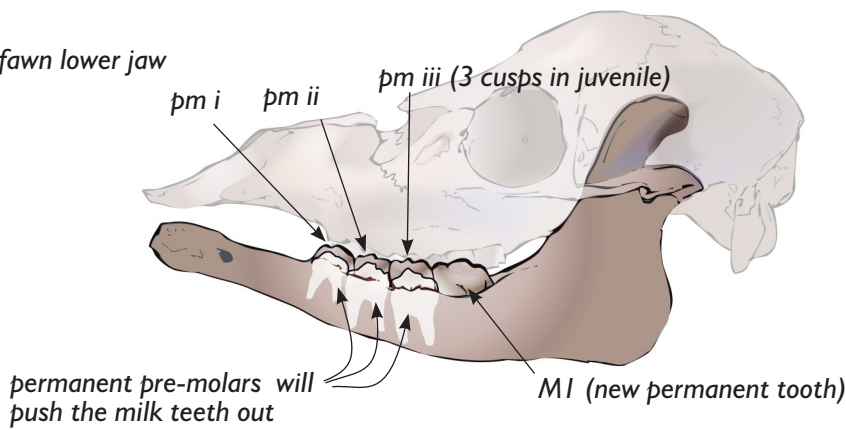
The tooth eruption pattern is consistent for individuals of the same species and age regardless of where they are from. Between species there are differences (see Table 1), but any deer with a three-cusped third pre-molar (pmiii) has not yet got its full complement of adult teeth and is therefore not an adult.

M3 is a large tooth and in many deer it takes a long time for the rearward cusp to become stained and come into wear even after all of the adult teeth are present, thus it can be useful in identifying young adults.

Table 1 - tooth eruption

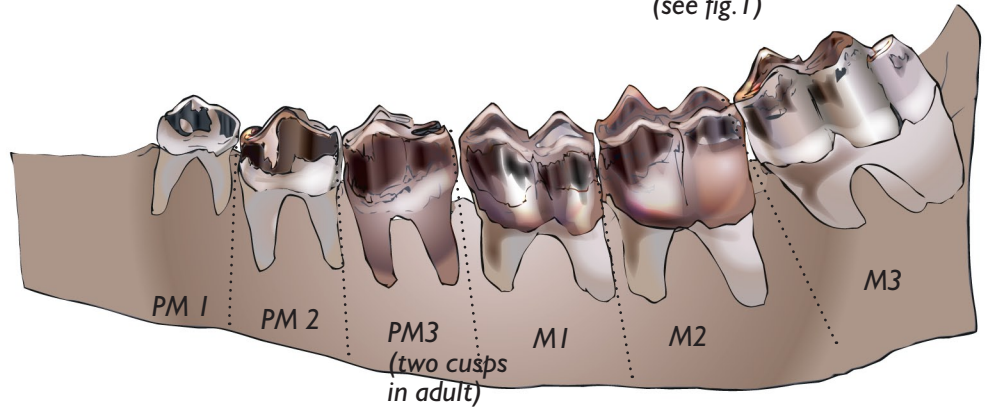
Species			Eruption
	Permanent cheek teeth present in lower jaw at 12-14 months	Approx age that all permanent teeth are present (if not yet fully in wear). PM3 does not have 3 cusps	Rear cusp of third molar is beginning to wear.
Red	M1, M2	30 months	36-48 months
Fallow	M1, M2	26 months	36-48 months
Sika	M1, M2	26 months	36-48 months
Roe	All	13 months	12-14 months
Muntjac	M1 - M3	19 months	25-34 months

fig. 1. calf/fawn lower jaw



M3 also has a third single cusp which is smaller and at the rear, not to be confused with 3 pairs of cusps of pmiii (see fig. 1)

fig. 2 adult jaw



Tooth wear

The wear pattern of adult teeth is not completely reliable for ageing but in general, young adult teeth are high and sharp and get progressively lower and smoother as they age. As the teeth wear the pattern of dentine, enamel and size of the infundibulum changes (see Table 2).

Adult teeth may break up and be lost in old age and tooth wear can be one of the limiting factors in any deer's life-span.

fig. 3 young tooth:

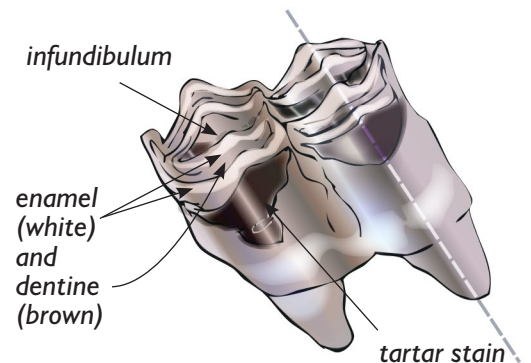


fig. 4 older tooth: Older tooth: brown dentine is becoming wider than white enamel on all cusps

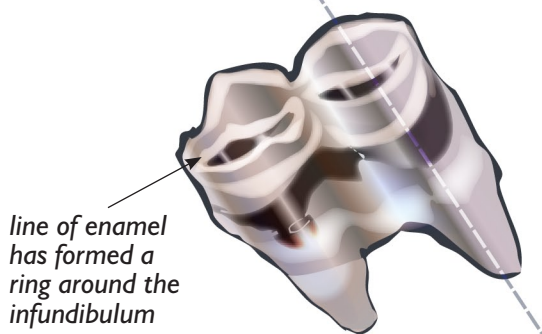


fig. 5 vertical cross section of tooth

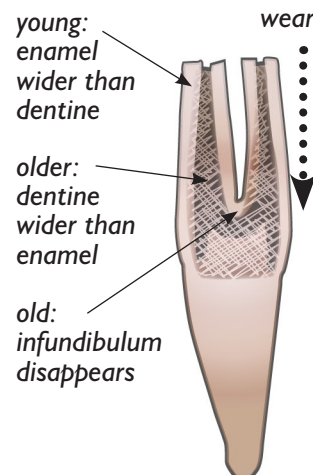


Table 2 - tooth wear

Species	Young adult	Early mid age	Late mid age	Old
	High crowns	<i>crowns get shorter on M1</i>	<i>shorter on all teeth</i>	<i>very short, same or less than height of exposed root (where visible)</i>
	High, sharp cusps	<i>crowns get shorter and smoother on M1 M2</i>	<i>smoother and shorter on all teeth</i>	<i>smoothed or worn flat</i>
	White enamel wider than brown dentine	<i>dentine becoming wider than enamel</i>	<i>dentine twice as wide as enamel on all teeth. Enamel ridge in centre of M1 becoming indistinct or absent</i>	<i>indistinct or no enamel ridges in centre of any teeth</i>
	Deep infundibulum	<i>shallower, completely surrounded by enamel on M1, M2</i>	<i>shallow on all teeth, surrounded by enamel on all teeth, shrinking in size on M1 M2 or absent</i>	<i>disappears on majority of teeth</i>
Red	2-4 years	5-8	9-12	12+
Fallow	2-4 years	5-8	9-12	12+
Sika	2-4 years	5-8	9-12	12+
Roe	1-3 years	4-5	6-7	8+
Muntjac	2-4 years	5-7	8-9	10+

Further Info

Chapman, N. (2006) How old is that muntjac? DEER 14 (2) pp 25-28

Brown, W.A.B. & Chapman, N. (1990) The dentition of fallow deer (*Dama dama*): A scoring scheme to assess age from wear of the permanent molariform teeth. *J.Zool., Lond* 221,659-682

Brown, W.A.B. & Chapman, Norma (1991) The dentition of red deer (*Cervus elaphus*): A scoring scheme to assess age from wear of the permanent molariform teeth. *J.Zool., Lond* 224,519-536

Chapman, N., Brown W.A.B., Rothery, P. 2005 Assessing the age of Reeves' muntjac (*Muntiacus reevesi*) by scoring wear of the mandibular molars. *J.Zool., Lond* 267,233-247

Mitchell, B. and Youngson, R.W. (1969) Teeth and Age in Scottish red deer – a practical guide to the determination of age. The Red Deer Commission Annual Report for 1968

fig. 6 **old tooth:** cusps worn flat, surface smooth and hollowed out, central enamel ridges and infundibulum nearly gone



Chapman, D. Chapman, N. (1997) Fallow Deer: Their History, Distribution and Biology

HEWISON A.J.M. et al (1999) Tests of age determination from tooth wear on roe deer of known age: variation within and between populations. *Canadian JOURNAL OF ZOOLOGY* 77,58-67