

VENISON



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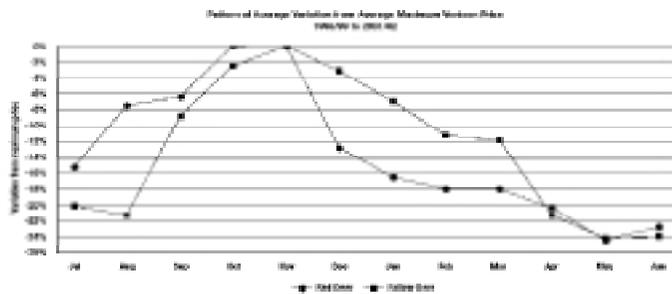
Archaeological evidence shows that humans have been eating venison for many more centuries than beef or lamb and that venison was the basis of meat diets in Europe for at least 5,000 years and in some areas up to 50,000 years [30]. Fletcher [30] also suggests that venison used in diets was sourced from managed deer populations and not only hunting of feral populations.

In his paper, Fletcher [30] discussed the health attributes of venison and related it to human physiology that indicates that man is better adapted to cope with the lean meat of venison rather than higher fat content meat of other species. The need for fat, the ease of domestication, the need for draft animals and animal fibre led to rapid domestication of sheep and cattle in preference to deer about 8,000 years ago. Over time human needs changed. In modern times we do not need high fat diets, candles or draft animals, and consumer demand is increasingly for lean meat. The deer industry can easily demonstrate that the quality and low fat content of venison available today is better suited to our physiological and modern life style requirements based on:

- Our increasing need for lean meat
- The lack of human intervention in genetic selection of deer that has kept its meat lean
- The physiology of human digestion that predisposes it to lean meat digestion

Ideal Sale Times

Industry data compiled since 1998 clearly indicates the months in which higher prices per kilogram are paid to farmers for venison [87]. The price pattern shown reflects the seasonal demand experienced by the Australian industry from its major clients in Europe. The information is summarised in Graph 33.



Graph 33: Pattern of variation in venison price

On average the peak price paid for Fallow venison occurs in November and the price paid for Fallow venison sold in October and December is about 2% and 13% less than the price paid in November.

Graph 33 also demonstrates that:

- The average price per kilogram paid for Fallow deer venison in the months September, October and November is greater than the price paid for all other months
- If Fallow deer are not ready for processing by March, they are likely to return more (\$/kg Hot Carcase Weight [HCW]) if they held over until at least September

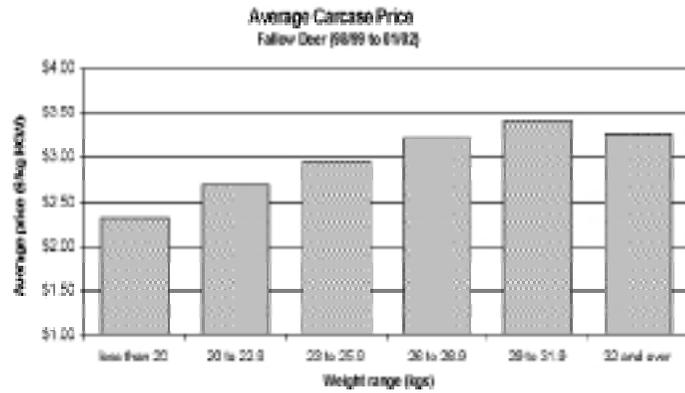
The peak average price for Red deer venison lasts for about two months (October and November) and the variation in price per kilogram paid for animals sold between September and January is only about 5%. If Red deer are not ready for processing by March, they are likely to return more (\$/kg Hot Carcase Weight [HCW]) if they held over until at least August. The cost/benefit of this management option needs to be carefully assessed.

Target Sale Weights

Data from [86] and [87] and summarised in Graphs 33 and 34 clearly suggests that prime carcase weight ranges that could be regarded as ‘ideal’ for red, and Fallow deer are 55 to 75 kgs and 25 to 35 kgs respectively. The information clearly demonstrates that Red deer and Red deer hybrids with carcase weights above ideal weight ranges do not attract more \$ per kg HCW weight than those within ideal weight ranges. It also shows that Fallow deer hot carcase weight generally reflects the average venison price. There is an obvious opportunity to maximise grower returns by achieving ideal carcase weight in September, October and March (see above).



Graph 34: Average price of Red deer venison



Graph 35: Average price of Fallow deer venison

Body Condition Scoring

Body condition may influence many aspects of deer production and profitability including reproductive performance, susceptibility to disease and returns from processed animals.

Condition scoring can also be used to identify appropriate husbandry programs that may be required to maximize reproductive performance, reduce susceptibility to disease, when to commence supplementary feeding, etc.

A system of visual, live animal assessment combined with objective Hot Standard Carcase Weight (HSCW) measurement benefits farmers who produce ideal carcasses, penalises those who don't and will subsequently improve the average quality of venison available to markets.

Australian Body Condition Scoring Charts for Deer were cooperatively developed to aid Australian deer farmers and processors objectively assess the body condition of deer. They are intended as a guide and may be amended in the future if new information becomes available.

Live Animal Body Condition Scores

The body condition score descriptions used in the charts are based on RIRDC project work undertaken by Hansen and McKay [39], Mulley and Flesch [63] and on the New Zealand Body Condition Score Chart for Deer produced by Audigé, Wilson and Morris [1].

Scoring is based on palpation of the spine, pelvis and rump of live animals. The simple scoring system varies from score 1 (emaciated) to 5 (over fat) and relates directly to carcase condition scores.

Score	Name	Description
1	Emaciated	No fat cover Pelvis, ribs and spine are prominent
2	Lean	Concave rump area Minimal fat cover Pelvis, ribs and spine still prominent but appear rounded rather than sharp
3	Prime	Ideal fat cover Pelvis, ribs and spine not readily distinguished Rump area is flat
4	Fat	Fat (some trimming necessary) Pelvis and rump rounded Spine covered by fat
5	Over Fat	Over fat (excessive trimming required) Pelvis concealed by fat Rump very convex Spine hard to palpate

Table 38: Guide Body Condition Scores for All deer

Carcase Condition Scores

Fallow Deer

Carcase condition scores for Fallow deer are determined by **fat depth** over the loin as suggested by research work undertaken by Mulley and Flesch at the University of Western Sydney [63] and in consultation with existing Australian venison processors.

Steps to locate the standard site and measure **fat depth** on a Fallow deer carcase are:

- Move along the spine from the head towards the tail
- Find the vertebra that is associated with the last rib (usually the most prominent vertebrae in a hanging carcass)
- Count the next five vertebrae towards the tail
- Measure 25 mm perpendicular to the mid line, and
- Measure **fat depth** (a Hennesy probe is an appropriate tool)

Score	Description	Fat Depth
1	Emaciated	No fat
2	Lean	Less than 2.0 mm
3	Prime	At least 2.0 but less than 4.0 mm
4	Fat	At least 4.0 but less than 6.0 mm
5	Over Fat	6.0 mm or more

Table 39: Guide carcase condition score for Fallow deer

Red Deer

Carcase condition scores for Red deer carcases are determined by **tissue depth** over the GR site that, based on unpublished work by New Zealand researcher Dr Ken Drew, is a good predictor of whole carcase fat content.

Steps to locate the standard site and measure **tissue depth** on a Red deer carcase are:

- Locate the GR site as described in the Australian Venison language and Specifications manual. It is that position 160 mm from the mid line of a carcase on the 12th rib and
- Measure tissue depth from surface to the bone (measured with a GR knife).

Score	Description	Fat Depth
1	Emaciated	No fat

Score	Description	Tissue Depth
1	Emaciated	Less than 5 mm
2	Lean	At least 5.0 and less than 10.0 mm
3	Prime	At least 10.0 but less than 15.0 mm
4	Fat	At least 15.0 but less than 20.0 mm
5	Over Fat	20.0 mm or more

Table 40: Guide carcase condition scores for Red deer

Interpretation of Condition Scoring Charts

For each of the condition scores, the charts (see colour plates 14 & 15) provide line drawings of live animals, photos of live animals and the carcases derived from each of the live animals.

The carcase shown as condition score 1 (emaciated) in the charts, depicts a carcase at the upper end of the range. This carcase and all carcases that have less condition, (muscle and fat) than that shown by the picture, must be considered emaciated.

Similarly, the carcase shown as condition score 5 (over fat) depicts the lower end of the over fat range. Any carcase with more condition than that shown (see depth measurements) must also be described as over fat.

Farmer Use of Condition Scoring Charts

Visual assessment of the body condition of live deer is difficult, particularly during cool months when coat hair is long. A long coat can disguise the actual appearance of the pelvis, ribs and spine while short coat can make an animal's appearance more irregular and highlight these areas. The charts highlight to farmers that the only reliable method of assessing live animal body condition is by palpation of the pelvis and spine.

The charts are used to explain to farmers that processors will pay less (\$/kg hot standard carcase weight) for animals that are over fat or emaciated and that accurate estimates of animal body condition can improve their returns by ensuring only those animals that meet processors specifications are made available for sale.

Written information on the charts advises that condition scoring can also be used to identify appropriate husbandry programs that may be required to maximize reproductive performance, reduce susceptibility to disease and when to commence supplementary feeding.

Processors Use of Condition Scoring Charts

Processors are continually being encouraged to differentiate farmer payment to penalise carcases that do not meet objective specifications and benefit those that do.

The charts provide an objective method of determining the body condition score for Red and Fallow deer carcases. The assessment can then be used to determine the hot standard carcase price that should be applied to each carcase. It ensures that prices are reduced for carcases that have low yields (emaciated) or require excessive trimming (fat).

Producers that provide carcases more closely aligned with processor requirements are assured of better returns than may be realised from fat or emaciated animals and subsequently farm profitability will improve.

Species Particulars

Red Deer

Venison is the major product of Red deer farming. Breeding and selection of animals for venison is based on animals that maximise production of high quality meat in the shortest time possible.

For Red deer dressing percentage (100 x hot carcase weight/live weight) ranges from 52 to 56% in stags aged 12 to 24 months. Carcase weights for Red deer range from 48 to 65 kg. Older animals and hybrid animals (Red x Wapiti/Elk) can be significantly larger.

Ideally fed and managed animals should be processed at 15 to 18 months of age to maximise venison quality and minimise grazing pressure on properties.

Fallow Deer

The major commercial product from Fallow Deer farming is venison.

In Fallow deer dressing percentage (100 x hot carcase weight/live weight) ranges from 52 to 58% in bucks aged 12 to 24 months with carcase weights of 22 to 32 kg. Older heavier bucks can produce carcase weights of up to 42 kg.

Ideally fed and managed animals should be processed at 15 to 18 months of age to maximise venison quality and minimise grazing pressure on properties.

Most available information on castration suggests that castrated animals have lower live weights than entire animals of similar age so it is not generally recommended as means of improving growth performance. However castrated animals can be processed while entire males are in the rut. This management practice provides an ability to supply markets with high quality product through the year.

Some European markets are said to preferentially consume venison produced by Fallow deer.

Wapiti/Elk

Venison is a major product of Wapiti farming. Breeding and selection of animals for venison production is based on animals that maximise production of high quality venison in the shortest time possible.

Cross breeding (Red x Wapiti) is one way to achieve earlier slaughter weights and avoid heavy supplementary feeding in Autumn as progeny are ready for processing at 11-12 months instead of 15 months as is common with pure Red deer.

Factors that should be considered in selecting a sire for venison production include:

- Production system
- Body weights of dams
- Breed of dams
- Market specifications for product

Terminal sires for venison production should be selected from stock available from recognised breeders who offer a distinct line selected and bred for venison production. Sires selected for venison production have visibly noticeable large hindquarters.

Dams should be proven breeders selected for size, preferably over 100kg.

Eastern European Red deer hinds are gaining popularity for crossing with Wapiti, because they tend to be larger than other Red deer (130+kg) and can take the larger Elk Bulls. A worthwhile rule of thumb in determining the size of a sire relative to a dam is the 3:1 Bull weight:Female weight ratio (i.e. the bull for a 100kg female should be no more than 300kg).

Sires and dams selected for velvet production should diversely originate from herds that can demonstrate selection and genetic improvement in velvet production capability.

A guide to average mature live weight of stock [98] is provided in Table 41 below, although readers should accept that there is variation within each of the subspecies groups.

	Female (kg)	Male (kg)
Red Deer	100	210
Red/Wapiti (Elk) Hybrid	130	256
NZ Wapiti	170	310
Wapiti (Elk)	230	400

Table 41: Average live weight

An example of the increase in size achieved by cross breeding Wapiti x Red deer offspring and pure Red deer offspring from [97] are provided in Tables 42 and 43.

Character	11 month Wapiti/Red	2 year old Red
Live weight	116.4kg	123kg
Dressing percentage	56.7%	56.9%
Tissue depth	4.7mm	10.0mm

Table 42: Live weight and Carcase Data

	One year old			Two years old		
	Live weight (kg)	Dressing %	Dressed weight (kg)	Live weight (kg)	Dressing %	Dressed weight (kg)
Red Deer	94.8	57.9	54.9	134.8	56.4	76.0
NZ Wapiti	-	-	-	167.4	52.5	87.9
NZ Wapiti x Red Deer	-	-	-	152.5	56.0	85.4
Canadian Wapiti (Elk) x Red Deer	116.4	50.1	67.6	-	-	-

Table 43: Comparative Carcase Data

Rusa Deer

While economic by-products such as hides and co-products such as velvet antler offer some income to Rusa deer farmers, the major commercial activity from Rusa deer farming is deer venison production.

The following information pertains to Javan Rusa only. Dressing percentages (100 x hot carcass weight/live weight) appear to range around 60 to 62% in stags aged 13 to 15 months with carcass weights of 40 to 55 kg (at optimal feeding levels). Carcase tissue (fat) depths will range from 8 to 18 mm at this age depending on level of nutrition and feed type.

Most meat animals are ideally slaughtered prior to the rut at between 14 to 20 months of age, with meat quality declining with increasing age at slaughter. Comparative data on castrate and entire male Rusa deer suggests similar meat quality and carcase weight attributes, however castrate males will have higher fat content in the carcase.

Assuming adequate standards of on-farm and pre-slaughter animal handling and husbandry, venison from Rusa deer is considered to compare favourably with that from other deer species.