Basic Principles of "Deer Farming for Profit"

The farming of red deer in New Zealand is carried out in a wide variety of soil types, topography and climate. Under all of these conditions, red deer perform with significant distinction. With the consolidation of the industry and the very bright future ahead it was decided that a co-ordinated extension campaign be convened to expound the basic principles of farming deer for profit.

In all cases the following basic principles are associated with good results in animal husbandry and hence profitability.

* High standard stockmanship
* Adequate facilities
* Good feeding system
* Preventative animal health
* Sound mating management policy

The basic technical papers were prepared and presented by the Ministry of Agriculture & Fisheries staff. The papers on profitability and marketing were prepared and presented as indicated. The papers were compiled for publication by Mr Peter Floyd.

Personnel 2
Stockmanship 4
Facilities 4
Feeding 8
Animal Health 11
Better Breeding 13
Meat Production 16
Antler Velvet Production 17
Profitability 20
Sharefarming 24
Marketing Venison 27
Marketing Antler Velvet 29
Contact Addresses 32

Personnel

The following people from the technical, advisory and commercial sectors of the deer farming industry combined resources in a lecture tour sponsored by Wrightson NMA Ltd.

P.G. Floyd

Convenor and co-ordinator of the Lecture Tour. Mr Floyd graduated from Massey and worked at the Ruakura Research Centre for six years, before purchasing a 110 ha. dairy farm. In 1973 he re-entered the technical arena and with the development of the deer industry established a consulting practice in deer farm management. His own farming operation has been converted to deer and is run in conjunction with his deer demonstration farm near Hamilton.

J.W. Asher, M.Sci (Hons) from Victoria University

Commenced work in 1980 at the Ruakura Animal Research Centre, Hamilton on the red and fallow deer which are farmed in the northern areas of the North Island. His studies involve the on-farm monitoring of the reproductive performance and growth rates of the deer.

K.R. Drew

From Lincoln College Mr Drew joined the staff of the Invermay Research Centre in 1963 and has remained there except for period of time at Ruakura and in the United States of America. In 1973 he was responsible for starting the Invermay deer research project and has remained in charge of that developing project. The Invermay deer farm is 75 ha and now carries 500 red, Wapiti, hybrid and fallow deer.

Dr Peter Fennessy, M.Ag. Science from Lincoln College, Ph.d from Adelaide University.

After working for one year at the Invermay Research Center, Dr Fennessy moved to Australia where he spent nearly four years researching nutrition in sheep. Since 1975 he has been back at Invermay where he now specialises in deer nutrition, antler growth and sheep and lamb production. Earlier this year, Dr Fennessy visited China with the New Zealand Deer Farmers' delegation.

Michael Harbord, B.Ag Science from Massey University.

Mr Harbord is a Farm Advisory Officer with the Ministry of Agriculture and Fisheries in Invercargill. In recent years, he has co-operated with local deer farmers and the Invermay research deer team to monitor certain aspects of deer management on Southland farms. The work has been valuable for confirming by practical application the research-derived feed requirements of deer and for developing feeding and grazing systems.

R.L. Hughes, New Zealand deer manager, Wrightson NMA Limited.

Mr Hughes has been involved in the deer industry for five years, including the last two as national manager of the deer division. This includes the purchase and sales of deer, velvet and the marketing of venison. He has spent a considerable amount of time in Asian countries investigating the velvet markets and promoting the sale of this product along with other by-products of the deer industry.

P.J. Morrissey, general manager, T.J. Edmonds Ltd.

Mr Morrissey became involved in the game industry in 1964 when he joined Graham Stewart and Co, one of the pioneer companies in the recovery of game by helicopter. These activities were expanded with the purchase of the Stewart company by T.J. Edmonds. Mr Morrissey is now responsible for field recovery, transport, processing and marketing of feral game meat and by-products for Edmonds' Game Consolidated. This involves regular visits overseas to maximise returns from New Zealand's "traditional" markets for feral game products.

Stockmanship

One of the most important inputs in any successful deer farming enterprise is that of stockmanship.

A high standard of stockmanship is the key to optimum returns from farming deer. If you have little or no patience with animals, then the farming of deer is not for you.

Always approach animals quietly. Apply pressure slowly and firmly without rushing. Let the deer make their own way but move positively, without hesitation, as the deer, just like other stock, are quick to detect incompetence. Always move slowly, as deer will then not panic, broken legs will not occur and the animals will be a pleasure to work with.

It is better to handle deer with two competent men than with a big team who have a minimum of experience. Dogs may be used but only if they are under good control.

It can not be stressed too highly that a high standard of stockmanship is a very important input in the farming of deer for profit.

Adequate Facilities

Farm layout and yard design have an important bearing on the workability of a deer farm and consequently the ease of stock management. These facilities need to be adequate without being expensive. They need to be practical, not elaborate, and they need to meet the requirements of both the deer and the farmer.

Fences

Boundary fences of high quality boundary netting with stay wires 150mm apart, or 14-18 plain wires plus battens, should be 2.0 metres in height, with posts 5 metres apart. Sub-divisional fencing needs to be around 1.6 metres high, with posts up to 10 metres apart, and can range from netting with stay wires 300mm apart, to variations of the wire and batten type, to electric fences of six wires. This latter type is gaining popularity due to its efficiency in controlling deer, and its low cost.

Problems have been encountered with some fences during fawning whereby newly born fawns get through a fence and cannot get back to their mothers and consequently die. The answer to this problem is either to have a completely stock proof fence or have a fence like a six wire electric one that young fawns can in fact crawl back under. (see photo 1 pg 5)

Photo 1 (above) A 6 plain wire electrified fence 1.6 metres high.

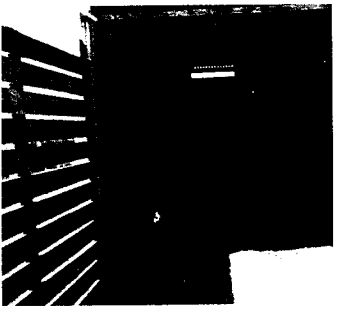
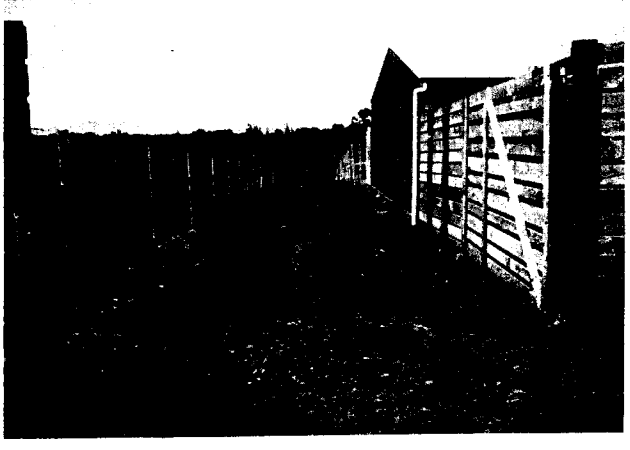


Photo 3 (above) View from circular pen into holding pen, illustrating the use of the plywood and half round post construction method.

Photo 2 (below) Central race 6.0 metres wide illustrating screened turning point on left and sighter boards on netting fence. Deer shed and yards on right hand side.



Layout

The provision of central type raceways enables deer to be moved from paddock to yards easily. These should not be less than 6 metres in width and wider on large properties. The section of race close to the yards and the turning points are best screened with trees, sighter boards, or other equivalent materials. (see photo 2 pg 5)

General farm layout should ideally have every paddock adjacent to a raceway, however contour and farm shape may well dictate otherwise. The benefits of contour fencing for deer are just as with sheep and cattle, enabling better utilisation of farmed area, and thus greater productivity. There are benefits from having square shaped paddocks, but it is not as important as in yard design.

There should be a minimum of 10 paddocks on a small farm running 100 head, if a good standard of husbandry is to be practiced. As farm size increases, and mob types and size increase, then more paddocks are beneficial.

The placing of gates invariably stretches one's understanding of deer, however gates placed 2.0 metres from the corner, allowing a space for a shade tree and opening into the paddock, create a gap that deer move through readily. Gates between each paddock as well as onto the raceway have shown to be of great assistance in stock movement.

Yards

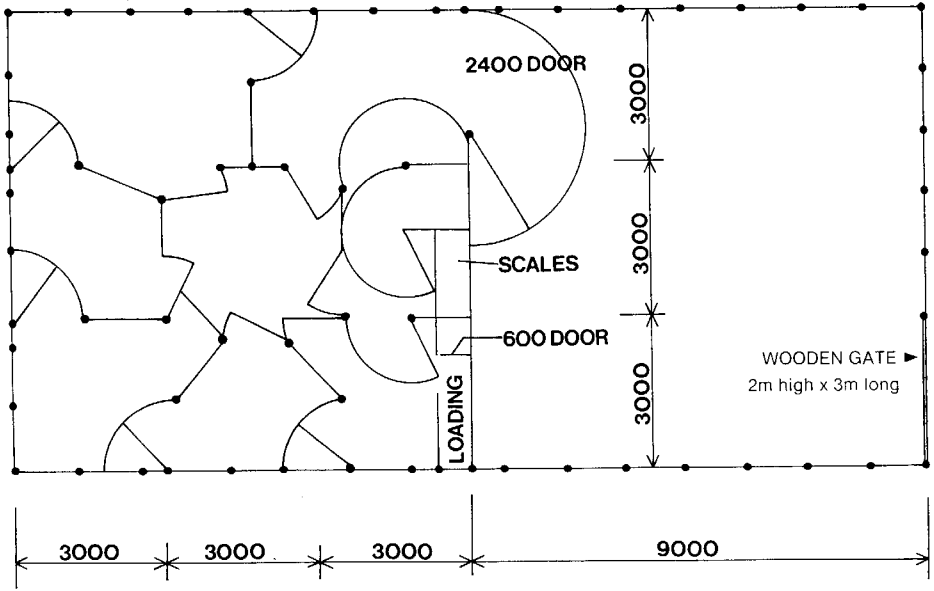
Yards should be built utilising the square yard principle. Animals will move more freely in square yards as opposed to rectangular or triangular shapes, and deer will not mob or pile up to the same degree. Round yards have advantages, but are expensive to construct. Thus a round yard is only recommended as a central draughting area where small mobs of deer are place for draughting. This yard needs to be of 3.5 metres diameter on a one man farm, or around 5 metres diameter when two men are draughting. This draughting system reduces stress on deer and man, as deer flow freely around the circle in an anti-clockwise direction until they are ushered quietly out the appropriate draughting gate. (see photo 3 page 5)

On a one man farm small pens around 3 metres square should be adjacent to the circular pen to hold each type of mob draughted off. Larger outside pens may be provided as the demand is created through increased stock numbers. Larger farms would provide fewer draughting alternatives from the circle, but would have pens 6 x 6 metres or larger to draught into. As a guide, a 9 x 9 metre pen will hold around 100 average size red deer hinds, providing they are reasonably quiet. During initial yard training of deer, smaller numbers are advisable.

The area set aside for drenching, vaccinating, etc, or the crush, as it is often called, is invariably best situated adjacent to the draughting circle and loading out facility. This pen should be 1500mm square, with a

Deer shed and yard

Scale 1:100



Note: 1. All pen doors 1200mm wide except where indicated
2. 3m posts 175mm wide every 1200mm or 600 intervals

sweep gate to assist loading. This pen will hold four to five hinds or six weaners, which is a very satisfactory number for one man to drench, tag or vaccinate by himself. Again two man facilities may be larger but the square principle allows animals to move sufficiently without causing harm to themselves or their handler.

A flexible loading facility enabling either trailers or trucks to be catered for should be planned close to the drenching pen. With the upgrading of farm management techniques, and the commencement of slaughtering farmed deer, all yards should provide for a weighing system. Usually this can be incorporated between the drenching pen and the loading race.

The question of whether to erect a roof over the handling facilities will depend on personal preference. There are advantages, but it is important that roofed yards have solid walls and doors so as to minimise light penetration and thus facilitate stock flow, as animals tend to be more content in subdued light. Adequate ventiliation needs to be provided, and a stud height of 2.4 metres is recommended. Doors and/or gates need to be fitted flush, with minimum gaps, and spring loaded catches of the flush 'built in type' assist in minimising places where animals can get caught and break legs, or rub skin and hair off.

Outside yards that are constructed of 25mm thick timber with 22mm gaps, invariably seem to lead to quieter deer that handle easily. These fences need to be around 2.2 metres high, with wooden gates swinging back flush with the fence.

There should be fresh water in every paddock, and troughs, unless they are small or covered, will require cleaning frequently. The provision of shelter trees is debatable, however deer, just like any other class of animal, tend to seek out the shady areas during summer, and trees planted in strategic positions can give good shelter during the winter months.

Feeding

Feeding is the most important input into any livestock farming enterprise, and it is no different when farming deer for profit, as the most important daily task is to balance the seasonal feed requirements of the animals to the seasonal pasture production.

Pasture is the best and cheapest form of feed, but quality and quantity vary seasonally. In most regions supply is reliable in spring and winter, very unreliable in summer and uncertain in autumn. Quality refers to the stage of plant growth when harvested, and the type of feed. Spring pasture is very nutritious, but feed quality decreases in summer as seen in the following table.

FEED VALUE — ME UNITS*/Kg DM**

Pasture	Spring	12.0	Crops	Swedes/Turnips	12.0
	Summer	10.0	Grain	Maize	14.0
Silage	High moisture	10.0		Barley	12.5
Hay	Lucerne	9.0		Oats	11.5
	Meadow	8.0	Deer Nuts		11.0

* ME UNIT—Metabolisable energy unit
**DM—Dry matter

The use of good sub-division and a rotational grazing system similar to that used for sheep and cattle is the best way to utilise pasture. The added benefit of using a 4 wire temporary electric fence in winter and other times of the year to ration and control pasture cannot be over emphasised as a very good management aid.

The best use and choice of supplements will be dependent on their feed value as related to the price per useable feed unit. Supplementary feed needs to be fed in a manner that minimises wastage and maximises benefits from the expenditure incurred.

The animal feed requirement also varies considerably over a season and the accompanying table shows deer requirements expressed in feed units. The feed requirements for a ewe rearing a lamb are also shown in order to give a direct comparison.

Metabolisable energy requirements of red deer (MJ ME/day).

	Autumn	Winter	Spring	Summer	Annual stock units
Stags					
3-15 months	16	19	27	26	1.4
15-27 months	24	28	31	30	1.8
Older stags	19	35	42	38	2.2
Hinds					
3-15 months	15	18	22	21	1.2
Older hinds	23	22	24	47	1.9
Ewe rearing lamb (standard stock unit)	13	10	28	11	1.0*

*One SU requires about 540 kg pasture DM per year.

Stags

It may be noted that older stags need little feed in autumn and in fact lose up to 30% of their liveweight over this period, but in winter they have a high feed requirement due to a high loss of body fat during the mating season, poor insulation and a high loss of body heat. The provision of good shelter may well assist in reducing the feed requirements over the winter. Younger stags need to be fed to requirements in order to achieve good liveweight gains, particularly if they are to be slaughtered at around 2 years of age.

Hinds

Young hinds need increasing amounts of feed as they grow to maturity. Older hinds then need equal amounts of feed during the autumn, winter and spring, but their requirement during lactation (December-March) more than doubles. It is important not to overfeed hinds prior to lactation, thus pasture management during November and over the following months is critical if hinds are to produce adequate milk for good fawn growth rates. Liveweight of fawns at 100 days can be improved by over 30% just by good management over the lactation period.

Pasture at the short vegetation stage is best for both milk production and liveweight gain in young stock. The provision of small areas, one square metre per 10 hinds, of longer grass or branches, is more than sufficient to provide areas for hinds to hide their fawns. Yearling hinds need to be well fed to achieve at least 65 Kg liveweight prior to mating in order to get in fawn.

It may be concluded that understanding and relating the feed requirement of deer to the feed available is the most important input into farming deer for profit. Feed control is most essential.

Animal Health

The key feature in deer health is disease prevention. This is more important with deer than traditional livestock because deer are easily stressed by yarding, handling or underfeeding, and most of the serious health bazards in farmed deer seem to be associated with stress.

It is always important to feed adequately. Several of the major diseases seem to occur more frequently when feeding is inadequate. Matching feed supply with feed requirement is vital. Handle deer in yards with care and patience to reduce stress. Good handling facilities help prevent injury and stress. Watch abnormal behaviour closely. It may not be possible to save an animal that suddenly shows disease symptoms, but an early post mortem should reveal the cause of death and allow action to reduce the incidence of further disease.

Internal Parasites

Lungworms are the most important parasites in farmed red deer. While all age groups are susceptible to infestation, young animals appear to be more severely affected. Heavy infestations, particularly during the autumn and early winter, have caused deaths, and lighter infestations are believed to cause production losses. Differences in microclimate, stocking rates, feeding levels and histories of anthelmintic treatment between farms lead to wide between-farm variations.

The parasite Dictyocaucus viviparus is the only species of lungworm found in red deer in New Zealand, and is the same one found in cattle. In a recent survey, lungworm was reported as the most frequently occurring problem in deer farms. Prevention is by drenching young stock every three weeks from 3 months until 12 months of age.

Roundworms are found in red deer and control is by adopting the programme as recommended for lungworm control.

External Parasites

External parasites are not a major problem among deer. Control is by adopting similar methods as those used for cattle, but discussions should be held with a veterinarian as to the best choice of drugs to use.

Clostridial Disease

The common diseases caused by bacteria or clostridial organisms are pulpy kidney and malignant oedema. However other diseases such as blackleg, tetanus and blacks disease can be a problem on some farms. Infection usually occurs in young stock and prevention is readily attained by vaccinating hinds 3-4 weeks prior to fawning, and fawns at 2 months of age.

Malignant Catarrhal Fever (MCF)

This is the biggest single problem disease on deer farms, as at this time there is no known cure. It is common throughout the country, and animals lose their appetite and usually separate themselves from the herd and die quickly from the virus. A post mortem will reveal severe bleeding and inflamation of the intestine and sometimes a mucous discharge from the eyes and nose. Treatment is not possible, however animals should be spread out over the farm to reduce cross infection.

Yersiniosis

This is a bacterial disease that can often be confused with MCF because the gut is frequently found to be severely inflamed. In a similar way to MCF this disease seems frequently to be associated with physical or feed stress. Treatment with antibiotics is very effective if given early or in a protective way, if an outbreak is suspected.

Tuberculosis (Tb)

This disease has been known in wild deer for many years and is now causing spasmodic problems in our farmed deer herds. Infective bacteria can be spread through inhalation, drinking water, feed or licking. Treatment is not practical and infected animals should be destroyed. The cattle Tb test given in the neck is now widely used although some misleading results have occurred. However, it cannot be overstressed that any prospective purchaser of deer should insist on a Tb test prior to accepting delivery of any deer.

Leptospirosis

The incidence of this disease has been very low in deer. Where problems do arise or a history of the disease is apparent, then a vaccination programme is recommended.

General

Other animal health problems that occur in deer are similar to those experienced in sheep and cattle and require the same type of treatment. These include foot problems, mineral deficiencies, salmonella and facial eczema in warmer climates.

Prevention is always better and cheaper than the cure, thus a high standard of animal husbandry and good farm management, which reduces stress, together with a preventative animal health programme will reduce losses to a minimum.

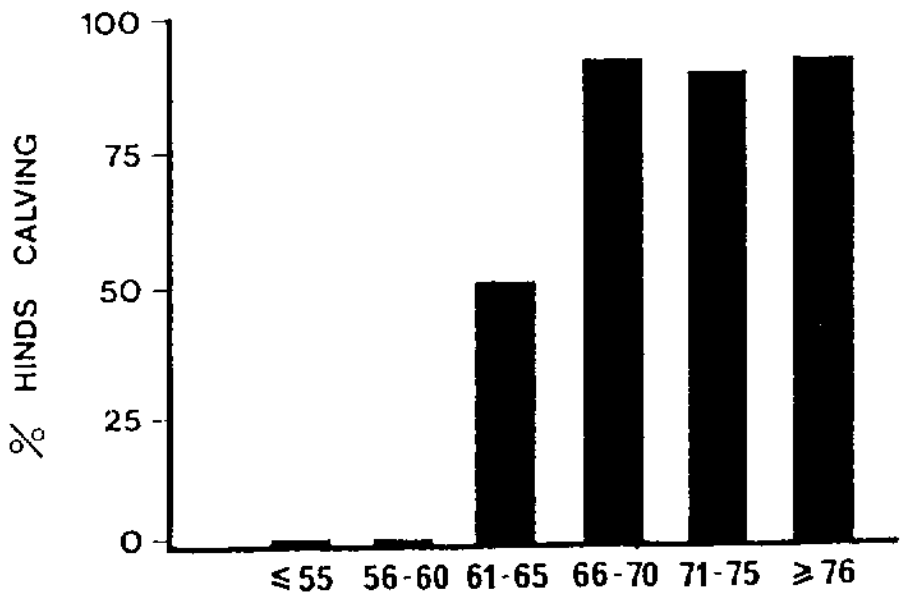
Better Breeding

The objective of any breeding programme should be to improve the productivity of the base herd by selecting male and female animals that are capable of improving the traits that you, as a deer farmer, prefer to see improved.

The basic steps in any mating management programme require certain decisions to be made, related to the long term objective of the farming operation. Thus a planned animal breeding programme is required, based on the contribution that breeding can make to improving animal performance and profitability.

The relevant fact when deciding what you want in an animal is that the more traits you require and select for, the slower will be the progress towards your ultimate goal. The three most popular points that are used as selection criteria in deer are: Liveweight
Temperament
Velvet Production

As scientific information tends to show a strong correlation between liveweight and velvet production, this should tend to simplify mating management decisions. Liveweight has a marked effect on the fawning performance of hinds. It is very important to grow young hinds well enough so that they will be at least 65 kilograms at 15 months of age. Older hinds need to be around 85 kilograms liveweight and in good physical condition prior to mating.



This graph illustrates the relationship of liveweight at mating to fawning percentage at two years of age.

Liveweight of stags at 15 months is strongly correlated to ultimate size, and further weighings at 2 years assist greatly in deciding what stags to use for future breeding programmes, and what stags can be culled or slaughtered. Also the recording of when the hard antler buttons are shed, antler velvet yield, grade, time of cutting and length and number of tines, can readily assist in mating management.

Recording System

The establishment of a good recording system is a very important aspect of animal breeding. Simple selection criteria such as 2 year stag liveweight, velvet production and temperament should be utilised as methods of improving the base herd performance. Selection of hinds would again be on size, temperament, and the ability to raise a good fawn to say, 100 days of age. The examining of teeth and udders of hinds during March, and recording those that have reared a fawn, will assist in determining the hinds to be mated to the best stag, or those to be culled.

The identification of the dam to its fawn has been achieved using various methods. The tagging of fawns at birth can be successfully accomplished under intensive farming systems, but considerable care and attention is essential. The alternative of separating the hinds from their fawns during March for a few hours, and then releasing a few fawns at a time and observing the suckling patterns with the possible aid of binoculars, has a place in relating dam to offspring. Weaning fawns from their mothers prior to the mating season has a number of advantages, as the selection of superior hinds based on their past season's performance can be more readily utilised.

The provision of shelter in the form of a small area of long grass in the middle of the paddock, say one square metre per 10 hinds, or some dead branches, appears beneficial to newly born fawns. It also allows easy location of new fawns if tagging at birth.

Once selected, then the best use of the superior animals is important. The use of a single sire mating system undoubtedly has many advantages. As a practice it is wise to replace the master stag after two cycles in order to minimise the effects of fatigue or any infertility problems. A stag in good condition should be quite capable of handling a mob of 50 hinds. Where possible yearling hinds should be mated separately from mature hinds.

Where single sire mating is not possible, then larger paddocks are preferred, and a number of stags are run at around one to 15 hinds. Under this mating system a hierarchy is established and one stag, usually the largest, becomes dominant and controls the harem. If there are a larger number of stags present, they may mix more freely with the hinds. Although distinct harems are not seen, one dominant stag still does most of the mating. In larger paddocks with broken terrain and cover, the herd will disperse into more smaller harems and subordinate stags will have a greater chance of mating with hinds. The running of antlered stags with hinds creates some unnecessary problems and it is more common now for farmers to seek velvet yield from their master stags, than to observe what sort of hard antlers have grown.

The characteristic roaring of stags during the breeding season is not an essential feature of mating performance. Stags may roar without mating and vice-versa. Roaring begins about a month before hinds are mated and continues for up to a month during mating. Hinds can be mated after roaring stops. Inbreeding or linebreeding has been used for generations in animal breeding programmes throughout the world, and providing it is well managed and understood, can be utilised to advantage.

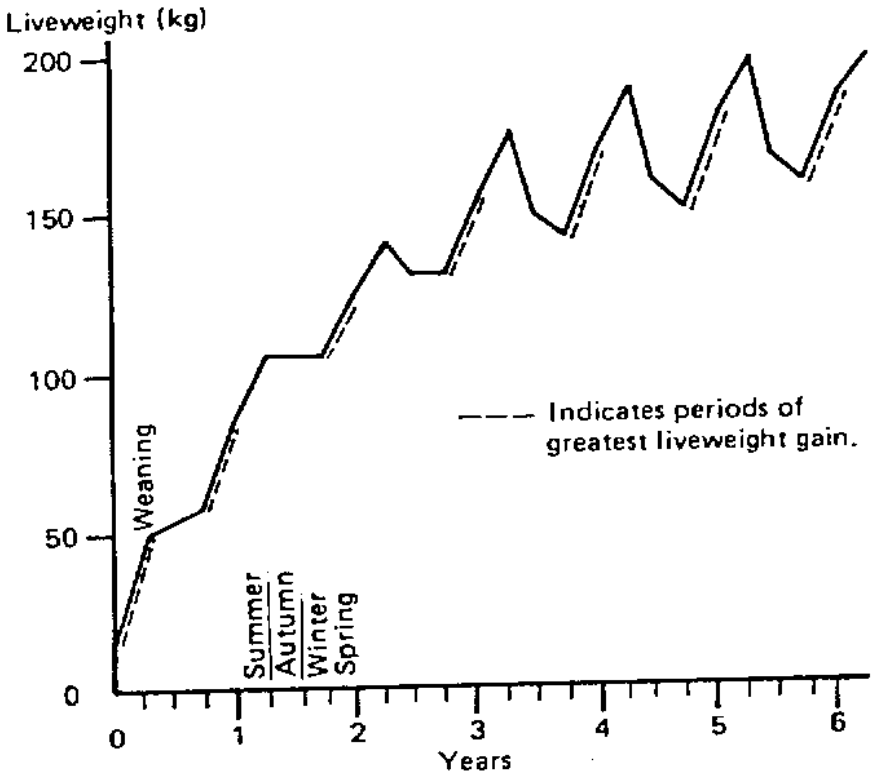
The basic reproductive characteristics of red deer are shown in the following table:

Puberty	Hinds—16 months Stags—14 months
Breeding Season	April-May
Breeding Season Duration	6 weeks
Length oestrus cycle	18 days
Gestation Length	233 days
Fawning	December-January
Fawning Percentage	80-95%
Birth Weight	6-8 Kg
Productive Life	10 years

Meat Production

Meat production from our deer farms is really just beginning and the prospects are very exciting. At the present time there is a clear definition between the two classes of venison.

1. Killed game—This is the traditional wild shot deer, where the carcass is inspected at a game packing house before being exported.
2. Slaughtered deer—To be recognised in this classification an animal must have a pre and post mortem inspection certificate and be killed in a licensed deer slaughter premise.



Liveweight Pattern of Red Stags

The growth rate of red deer is rapid and this graph shows the pattern of growth of red stags to maturity.

Deer meat or venison as it is mainly known, has a number of distinct advantages when compared with meat from our traditionally farmed livestock. Firstly deer have a greater proportion of their liveweight as carcass, than either cattle or sheep. Also as seen in the following table, deer have a lower fat content in the carcass.

CARCASS AS A PROPORTION OF LIVEWEIGHT

	Liveweight Kg	Carcass Kg	Dressing %	Fat Content %
Lambs	35	16	45	25-35
Cattle	400	220	55	20-25
Stag 2 yr	135	80	60	10-12

The fat deposits on a deer carcass are mainly on the surface of the back and in channel fat. It must be noted, however, that mature stags vary widely in fatness from year to year and if killed too late in the season (February-March) will have excess fat which should be avoided.

The other significant point is that there is a very high proportion of the whole carcass comprising saleable cuts, as over 50% of the carcass can be sold in the high price bracket and there is only about 6% as bone waste.

The other saleable products from a stag are the hide, tail, pizzle and testes, sinews and eye teeth. All command good prices on the export market.

With the development of the industry and the marketing of farmed deer as slaughtered game, this product with its particular qualities of low fat content and high protein level, will always ensure a premium price as a health food on world markets.

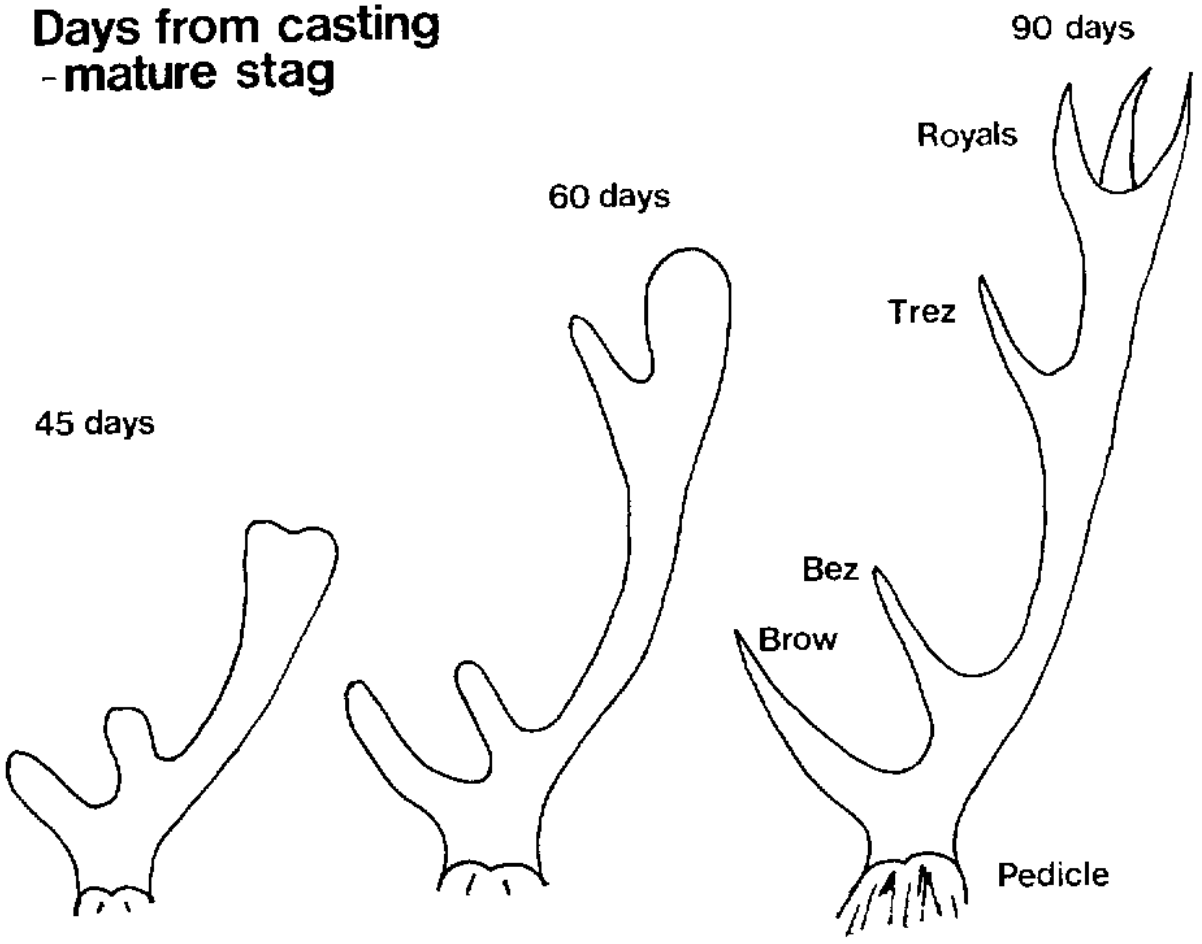
Antler Velvet Production

Antlers are outgrowths from the skull and develop from the pedicle which is a permanent structure arising from the skull. The early seasonal stage is cartilage which eventually hardens through mineralisation into bone. The marketable product 'antler velvet' is the entire immature antler cut at about two thirds ultimate size, before significant calcification has occurred. Antlers should not be confused with horns because they are formed as living tissue which is well supplied with blood vessels and nerves.

Growth

The antler initially develops with the growing of the pedicle during the first 3-6 months of life. The antler proper grows from the pedicle, and if left uncut will calcify in summer and the velvet skin will be cleaned off by the stag. In late winter each year the old antlers are cast and the new growth starts. The casting dates will vary from year to year depending on feeding levels, and possibly weather. As stags mature, usually the casting dates are earlier each year.

Days from casting - mature stag



The normal antler growth pattern is shown in the diagram. Variations will occur especially in two year olds, and some deer do not in fact develop a bez tine which is often considered an advantage. It is considered that the optimum time of cutting is around 60 days from the casting date and around 45-50 days in the case of two year olds.

Some mistakes are also occurring where the forming of the trez tine is confused with the budding of the royals and so harvesting is done prematurely. Thus it is of distinct advantage to record the casting date for each stag, as they can be placed into groups at this time, in readiness for harvesting. Failure to harvest antler velvet at the correct time will result in undue calcification and a loss of grading and hence profit.

Yield

There are a number of factors that can influence the amount of antler velvet produced. They are: Age
Nutrition
Climate
Genetics

Age

The yield of antler velvet increases as the stag matures. On average guidelines of

1.0 Kg at 2 years
1.6 Kg at 3 years
1.9 Kg at 4 years
2.2 Kg at 5 years
2.4 Kg for a mature animal illustrate this trend. However variations will be considerable and thus heavier weights would be recognised as above average animals. Exceptional animals have recorded in excess of 5 Kg of A grade velvet.

Nutrition

Research work has indicated that the level of feeding, especially in late winter and early spring, can influence the yield of antler velvet. Extra feed at this time will accelerate the date of casting and may give an extra amount of velvet.

Climate

The weather may affect the rate of growth, with low temperature reducing blood flow and the supply of nutrients.

Genetics

The selection of stags with superior antler velvet yield will probably result in raising overall herd yield, as indications at present are that hereditability is expected to be sufficiently high. Also the use of a cross breeding programme using Wapiti may have a place at some time in the future.

Profitability

by P.G. Floyd

Financial returns or profitability, will differ widely depending on the policy and objectives of each farmer. The principal factors affecting profit are fawning percentage, death rate, velvet yield, grading and price, venison price and of course livestock price. The basic standards and costs used in calculating these financial returns are:

Hinds fawn as two year olds
85% live fawns to weaning (6 months)
50-50 male/female fawns
5% death rate
10% culling
3% stag ratio
15% replacements

STOCK UNITS

Hinds 1.9
Stags 1.8-2.2
3-15 mths 1.2-1.4

The first table illustrates the very basic return available from farming a herd of 100 mixed aged red deer, utilising the known returns available from venison and velvet. Here, all surplus stock over and above the basic breeding herd are slaughtered at two years of age.

RETURNS — BREEDING HERD — 100 M/A HINDS SLAUGHTERING ANIMALS AT TWO YEARS OF AGE

VENISON						
2 yr Hinds	26	@	65 Kg	@	$3.50	$ 5,915
2 yr Stags	41	@	80 Kg	@	$3.50	11,480
Aged Hinds	10	@	75 Kg	@	$3.50	2,625
VELVET						
2 yr Stags	41	@	1 Kg	@	$70	2,870
Breeding Stags						1,000
GROSS INCOME						$23,890
RUNNING COSTS						6,456
NET INCOME						$17,434
NET/HIND						$174
Venison +/– $1/Kg = $57/Hind Velvet 2 yr +/– $10/Kg = $4/Hind						

This is at present a hypothetical example, as the price for female livestock exceeds carcass value. However, in order to give a base comparison, these calculations showing a return of $174 per hind are presented. Variations of $1 per kilogram of venison would affect the net return by $57 per hind. Currently returns of $5 per kilogram are being suggested which would take the net return per head to $251 or $1196 per hectare, or 12% return on capital.

The next table shows the returns from a farming policy of selling weaner hinds and stags compared with selling rising 2 year old hinds and slaughtering 2 year old stags. All of these figures are net following deductions for farm running costs of $15 per stock unit per year, so the surplus returns are available to meet taxation, labour and/or living costs and interest and principal on monies borrowed.

RETURNS — BREEDING HERD — 100 M/A HINDS

	FARMING POLICY			
	SELLING WEANERS		SELLING 1½ yr HINDS 2 yr STAGS	
Weaner Hinds	27 @ $700	$18,900		
Weaner Stags	43 @ $200	8,600		
1½ yr Hinds			26 @ $1100	$28,600
Aged Hinds	10 @ $500	5,000	10 @ $500	5,000
VENISON 2 yr Stags			41 @ 80 Kg @ $3.50	$11,480
VELVET 2 yr Stags			41 @ 1 Kg @ $70	2,870
Breeding Stags		1,000		1,500
GROSS INCOME		$33,500		$49,450
RUNNING COSTS		3,273		5,781
NET INCOME		$30,227		$43,669
NET/HIND		$302		$436
Weaner Hind	+/− $100 =	$27		
1½ yr Hind	+/− $100		=	$26
Aged Hinds	+/− $100 =	$10	=	$10
Weaner Stag	+/− $100 =	$43		
Venison	+/− $1/Kg		=	$33
2 yr Velvet	+/− $10		=	$4

The values utilised in calculating these returns are based on the average prices for livestock over the past season or so. However variations to these have been formulated and are shown, enabling ready calculations to be made to assess profitability based on the then current values applicable. The price shown for aged hinds is perhaps lower than actually achieved but considered more realistic than recently obtained.

The returns from farming stags for velvet and venison are shown in the next table. Again an increase in venison price has a significant effect on net returns, particularly in the fattening example, as indicated.

RETURNS — 100 STAGS

	FARMING POLICY			
	VELVET		BUYING 10 MONTHS SELLING 25 MONTHS	
VELVET				
M/A Stags	70 @ 2Kg @ $100	$14,000		
2 yr Stags	15 @ 1Kg @ $70	1,050	95 @ 1Kg @ $70	$6,650
1 yr Stags	15 @ .5Kg @ $10	75		
VENISON	10 @ 90Kg @ $3.50	3,150	95 @ 80Kg @ $3.50	26,600
GROSS INCOME		$18,275		$33,250
RUNNING COSTS		3,030		2,700
REPLACEMENTS	15 @ $200	3,000	100 @ $200	20,000
NET INCOME		$12,245		$10,550
NET/STAG		$122		$105
M/A	+/– $10/Kg =	$14		
2 yr Stag	+/– $10/Kg =	$1.50	=	$9.50
Venison	+/– $1/Kg		=	$76

The comparative returns table ilustrates the type of returns per hectare based on a carrying capacity of 20 stock units per hectare. It cannot be overstressed that these figures need to be kept in perspective and a full analysis of the overall financial situation, present land use, land carrying capacity, topography and climatic considerations, must be taken into account, when evaluating potential profit. These figures are a guide only, utilising bare land in all comparisons and allow for a set up price of $5,000 per hectare, ready to farm deer, dairying, or sheep and cattle respectively. The dairying returns are supplied by the New Zealand Dairy Board, and the sheep and cattle figures calculated from data supplied by the New Zealand Meat & Wool Boards Economic Service.

The dairy cow value has been calculated at $350 per animal and the sheep and cattle at $20 per stock unit. The stock value to achieve a return on capital for the velveting herd is $400 per head. All other stock values are utilised as in the tables, with M/A hinds being calculated at the same value as rising 2 year hinds.

COMPARATIVE RETURNS — 20 SU/HECTARE — $5000 L & B

FARMING POLICY	ANIMAL	STOCKING RATE	HECTARE	CAPITAL
HINDS				
Venison/Velvet	174	4.6	800	7.5%
Selling Weaners	302	9.0	2718	18.2%
Selling 1½-2yr olds	436	5.0	2180	20.8%
STAGS				
Velvet	122	10.0	1220	13.6%
Venison Buy 10mth/ Sell 25mth	105	11.0	1155	16.0%
DAIRYING	277	2.5	692	11.8%
SHEEP/BEEF				
Intensive N.I.	$12/SU		240	4.4%

These data are examples only and variations and improved returns can be achieved under actual policies formulated for the precise farm and farmer.

Finally the next table demonstrates the capital and land required to return a net income of $25,000 from which to meet labour and/or living, tax and interest and principal expenses. This example utilises values already presented. Again it must be stressed that the $5,000 per hectare figure is the cost of purchasing and developing a piece of land to a stage where it will support the various farming policies compared.

CAPITAL AND LAND REQUIRED TO RETURN $25,000 NET INCOME

FARMING POLICY	HECTARES	CAPITAL (L&B & STOCK)
HINDS		
Venison/Velvet	31.3	314,878
Selling Weaners	9.2	137,080
Selling 1½-2yr olds	11.5	120,750
STAGS		
Velvet	20.5	184,500
Venison-Buy 10mths/ Sell 25mths	21.6	155,520
DAIRYING	36.1	212,087
SHEEP/BEEF		
Intensive N.I.	104.2	562,680

The wide range of land area and capital required is self evident and highlights the profitability of farmed deer as an alternative land use. These examples are for land capable of carrying 20 stock units per hectare, thus it is important to evaluate each situation on its merit and carefully consider all of the factors relevant to successfully farming deer. It has been noted that in a few instances evaluated, due to a number of reasons, it has been just as profitable to in fact expand a current farming policy if it only requires more stock and not capital development.

The farming of deer is a new industry with a big future and, providing livestock prices do not reach silly levels and the projected venison price of $5 per kilogram supports an investment of $1100 per hind, then the contribution it will make to New Zealand's overall economy and export earnings will be very significant.

Sharefarming

by P.G. Floyd

The sharefarming of deer is a farming practice that has caught the imagination of both rural and urban people during the past few years. The original concept was in fact developed during the early 1970s when companies involved in the export of venison and by-products set up various sharefarming schemes with a handful of large scale sheep and cattle farmers in the South Island.

With the recent expansions in the industry, renewed interest in sharefarming has resulted whereby individual urban investors purchase

animals which are farmed by an acceptable farmer. It is therefore imperative that an intending sharefarmer research the market place and make his decision based on sound practical advice. The on-farm performance of deer varies between farms just like any farming enterprise, therefore the experience, standard or stockmanship, feeding practices, breeding policies and animal health programmes adopted have a large effect on the overall result achieved, and therefore the return on capital invested.

Sharefarming agreements should be drawn up by people with a high degree of competence and a basic understanding of the practical implications of dealing with livestock. Above all else, agreements must be simple so that all parties clearly understand and appreciate their various roles and responsibilities.

The sharefarmer provides the base stock which are then farmed by an experienced deer farmer who meets the farm running expenses. Due to competition and varying farming practices, there are a number of sharefarming agreements in the field. However, wide experience has shown that the most satisfactory agreements are those whereby profits or losses are divided on a 50:50 basis between sharefarmer and deer farmer. Utilising the following formula, any odd number of offspring are purchased by either party at current values or sold off and returns shared.

$$\text{Hind numbers} \times \text{fawning \%} \times \frac{50}{100} = \text{Number fawns} \times \text{ratio hinds} = \text{No hinds}$$
$$\text{ratio stags} = \text{No stags}$$

Usually, in order to enable an equal chance, the individual performance of investor's base animals are pooled on a herd basis, so therefore risks are spread over say, 100 animals. For taxation benefits and other reasons, it is recommended that ten hinds be considered a minimum investment.

Experienced farm consultants are now supervising sharefarming agreements and their involvement with the larger operations are seen as a well worthwhile input to the smooth running of such ventures, and very good value for the sharefarmer who has little knowledge of practical farming.

Financial Returns

Financial returns or annual income may vary depending on the policy and objectives of sharefarmers and agreed to between parties, varying from the static base herd with a maximum cash flow, to a minimum cash flow with a maximum build up of numbers.

SHAREFARMERS RETURN — 100 M/A HINDS

SELLING WEANERS

WEANER HINDS	6 @ $700	$4,200
WEANER STAGS	21 @ $200	4,200
AGED HINDS	10 @ $500	5,000
	NET INCOME	$13,400
	for—Debt servicing	
	Consultants fee	
	Tax	
	Insurance	
	NET/HIND	$134
+/− $100	WEANER HIND	= $6
+/− $50	WEANER STAG	= $10
+/− $100	AGED HIND	= $10
	RETURN ON CAPITAL	
HIND COST	$1100	= 12.2%

This budget shows the return from a cash flow policy for a 50% sharefarmer with a base herd of 100 animals, with the 50% split of progeny occurring at the end of each season (June). The farming policy of selling weaners utilises the basic standards as illustrated earlier in the profitability paper.

A nil cash flow policy of selling weaner stags and purchasing young in fawn hinds can show around 15% return on capital. These returns may be greatly increased up to twice the suggested return on capital, but are dependent on monies borrowed, taxable income and long term objectives.

It must be stressed that some of the advantages are associated with the current taxation policies and incentives laid down by Government, and may be changed from time to time. However further investment in agriculture is a necessary input to the country's future growth.

It may be concluded that the benefits and returns from sharefarming deer can be illustrated in many different ways. The objective of this paper is to demonstrate the basic principles of farming deer as a basis for further, more specific discussions.

Marketing of Venison

by P.J. Morrissey

In the mid '50s the pioneers of the New Zealand feral game industry located and took advantage of increasing demand for game meat in the rapidly improving economies of post war Europe—especially Germany. These export pioneers met the demand with a product and packaging which today would be considered as less than satisfactory but which was readily accepted by the marketplace and the import authorities at that time. As a matter of interest, initial shipments of venison were skinned and packed in the field, and the hind quarters (the only cut sold) were simply wrapped in jute, frozen and shipped.

In the last 25 years of course, we have seen tremendous improvements in the standard of hygiene, processing and packaging of all meats, and of course, game too has similarly improved as the requirements of both the consumer and the importing authorities have become more discerning. Over the years the industry has responded to the new requirements demanded by the marketplace and, as I'll illustrate later, has fulfilled one definition of marketing as "activities designed to plan, price, promote and distribute, satisfying products at a profit".

People in the game industry as we know it presently (and it's obviously in the process of change) sometimes hear comment from deer farmers and some aspiring exporters, that the marketing of feral game has been unduly restricted to Europe—and Germany in particular—and that insufficient emphasis has been placed on the development of other markets. Really this is not a valid claim. Firstly, many countries exclude the importation of game not supported with an ante mortem inspection certificate, so many potential markets have been closed to us until now. Of the remaining markets the industry supplies game to 25 individual countries, so there has in fact been very considerable diversification in the areas into which game is sold.

Let us stress however, that of the feral game exported, Europe and Scandinavia purchase in the region of 80%. These people know game; they are traditional game eaters; they traditionally hunt game themselves; and if buying they are prepared to pay good prices for it. There is no doubt that our traditional European markets are where farmed venison will be sold in volumes, not Australia, or the U.S.A., or Japan or the Middle East, but in Europe for our volume sales.

Quite obviously, the product will be marketed in a growing number of countries outside of Europe and undoubtedly venison will be an exciting new product to those who have previously not had access to a reliable source. Initially, because supplies will be relatively small, prices higher than those achieved in Europe may prevail, but it must be understood that for increased volume sales to be achieved in these new markets, a long and expensive consumer education programme must be undertaken. In addition, our experience has been that countries outside Europe

require for their restaurant trade only the best cuts of hinds and saddles, and of course this requirement in itself demands and achieves premium prices.

We in the industry also hear comment that insufficient cutting and packing and added value is achieved with game exports, and that we should be preparing a greater volume of packs for retail sale. Again this generalisation is not factual. Red deer venison is one of the most highly regarded game meats in Europe and, because of this, the best cuts of hinds and saddles command high prices. Of the venison sales made there, approximately 90% are sold to the consumer through restaurants and hotels, with the balance through supermarkets and cash and carry outlets. Only the lower priced cuts of shoulders and boneless B appear at the retail level as the unit price per kg for hinds and saddles would be prohibitively expensive.

For example, the German housewife purchasing game at a supermarket can choose between a kg pack of diced Boneless B/or shoulder meat at the New Zealand equivalent of approximately $7.40 or a kg of South American hare hind quarters and saddles at about the same price. But to purchase a boneless saddle or hind quarter through the same supermarket outlets, she would be required to pay approximately NZ$15.00 per kg—an unattractively high price of course. So to provide the product in the form most in demand by the market place, game is supplied in either bone in or boned primal cuts for use in the restaurants and hotel trades. Incidentally, game sold in such markets as Asia, U.S.A. and Japan is also virtually exclusively sold through the same hotel and restaurant outlets to the end consumer.

For the future it is paramount that exporters of game meats be licensed and maintained at the lowest possible numerical level. This is not to suggest that the marketing of farmed venison be confined to the companies currently marketing the vast majority of game today, or to G.P.H. licence holders. Most certainly the new game industry will see new exporters—and this will be beneficial to the industry—but they must be operators who understand marketing, and are experienced in dealing internationally. They must be people who won't talk the market down or be weak sellers, people who have the ability to expand the market for venison, not simply crowd in on markets already well catered for.

As a matter of interest, between 5 and 10% of current sales of game are made by people who don't hold a G.P.H. licence—people who for a number of years have successfully shifted product into a particular market or market segment, and whose involvement has been of very considerable advantage to the industry.

It is difficult to stress enough the need to control the number and quality of our game exporters for the future. In the purchasing countries throughout the world, game meat is distributed through a relatively small number of outlets. For example in Germany, the world's largest consumer

of game meats, there are only 32 wholesalers and fabricators. Currently in New Zealand there are apparently over 40 licensed game exporters. Now can you imagine the market chaos if these 40 exporters were let loose on the 32 German buyers—they would simply slaughter us.

In summary, the future for the marketing of farmed venison looks excellent—there is already considerable experience in the field, our traditional markets are grossly under-supplied with red deer venison, and there are new markets for meat with ante-mortem certificates (but incidentially we must carefully monitor fat content on farmed game exports). Because of this there seems little reason to believe that the farmer or aspiring deer farmer cannot continue to receive at least twice the price for his deer meat as that achieved by the beef farmer, even with Government minimum prices.

Antler Velvet Marketing

by R.L. Hughes

New Zealand exports antler velvet to many parts of the world. All of these markets tend to have different needs and during the past few years New Zealand exporters have been endeavouring to research the market-place and develop the requirements of each of these areas.

With the exception of Taiwan, we currently export all our antler velvet in the whole antler form, having been dried in New Zealand.

The countries we export to and the product they require are listed below in order of importance.

MARKET	TYPE OF PRODUCT	USED FOR
South Korea	A and B Grade	Local consumption
HongKong	C and D Grade	Slicing for local trade or for re-export
Taiwan	Dried D Grade	Slicing for local trade or for re-export
	Frozen, unprocessed	Local consumption
Singapore	C Grade	Supplying local herbal medicine shops
Hawaii	A and B Grade	Local consumption to resident Koreans and Chinese and for re-export to Korea
Mainland USA	C and D Grade	Local consumption by resident Koreans and Chinese

South Korea is the main market for all velvet exporting countries and is supplied by Russia, China, America, Europe, Alaska, as well as New Zealand. The size of the Korean market is difficult to assess accurately because of various factors, the main one being smuggling, however we estimate that the market is 28 tonnes of dried product annually. New Zealand supplies around 15% of this market or 4,200 kilograms of processed A & B Grade velvet.

The Koreans prefer Russian velvet, firstly as it is from the Siberian elk which is large in size. This is followed by the Chinese product, again because of size and the American product of the elk type, although only supplied in small quantity. New Zealand is fourth in the preference ranking, as the size of our antlers is smaller and there tend to be more tines which seem to contain less blood in the lower portion of the antler, than with the Chinese or Russian product. The two products from Europe are of the large elk type, but the processing is not good. The Alaskan or reindeer velvet is the least preferred in Korea.

Price

The main factor affecting the New Zealand product price in our principal market, South Korea, is the Check Price that the Korean Government sets each year for the importation of velvet. The Check Price is usually set in October and was established in 1981 at:—Alaskan—$300, New Zealand—$430-$600, Chinese—$500, Russian—$650-750, American—$600, and European—$500. Total duty applied to the product is now very close to 15% of the Check Price.

Last season's Check Price for the New Zealand product was $430 per kilogram and this year it has been allowed to float between $430-$600. The floating Check Price is mainly due to the fact that New Zealand velvet appears to have less blood and thus colour in the lower portion compared to other types.

This situation has been causing some concern to the Ministry of Health and Social Affairs in Korea and they have recently announced that only the part of New Zealand velvet that shows the reddest colour of dried blood will be acceptable.

These new regulations insist on the cutting off of the lower portion of our antler velvet. Cutting has been done in the past for calcification but not for colour, but with the improvements achieved in processing over the past 12 months, and continuing research, it is obvious this new regulation can be reduced to have a minimum effect. So it is the intention of the Korean Government at this time to allow the New Zealand Check Price to float between $430 and $600 until our product comes onto the market and they are able to establish a firm market price.

Quality

The second factor affecting our product price in Korea is the quality. The New Zealand standard of processing has improved greatly in recent years and with the development of more refined techniques, the colour and smell or quality of the product can meet all the criteria acceptable to the market. The size of the New Zealand antler velvet product will be improved with better animal husbandry practices of feeding and breeding, and the advent of crossbreeding will also have a part to play in the future.

Delivery

The delivery time of the product onto the Korean market undoubtedly has a significant effect on product price. The Russian and Chinese product comes onto the market in late November-December and the New Zealand product starts to arrive late December, and causes some flooding of the market which is difficult to avoid. In order to achieve top market prices it may be necessary to hold onto a percentage of our product until the September-October period.

The Future

New Zealand's main competitors are Russia and China, who have been farming deer and processing velvet for a very long time, but our ability to compete in the future is extremely good. New Zealand farmers are world renown for their ability with regard to stock and pasture management, and this is certainly apparent with deer farming.

The facilities and personnel that are available to our farmers at such places as Invermay, Ruakura, Massey, and Lincoln plus their keenness to be involved with the development of this new industry, are important factors. Although this new facet of farming is only 15 years old, recording systems relating to weight gain, antler growth production, and performance, have already been developed to assist in the upgrading of the basic herd. These are achievements that other sections of farming took decades to establish.

In the processing field companies like Wrightson NMA have made a financial and marketing commitment to the industry and highly skilled people from the food science and bio-technology faculties have been employed in achieving improved processing quality of our product.

These basic facts, plus the willingness of everyone involved in this industry to achieve these improvements makes us confident that New Zealand can successfully compete on world velvet markets.

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