RURAL INDUSTRIES RESEARCH
& DEVELOPMENT CORPORATION

Australian Velvet Antler and Deer Co Products

Developing domestic markets

Part A

A report for the Rural Industries Research and Development Corporation

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Rural Industry Developments

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Foreword

Since becoming a commercial product based industry, the profitability of the Australian deer industry has been based on returns from the sale of venison and velvet antler.

While the profitability of the world's biggest farmed deer industry (New Zealand) is similarly based on the sale of venison and velvet antler, it also obtains a significant boost to returns from the sale of value added velvet and venison co products.

In the past, the Australian industry has been unable to develop markets for co products per se and value added velvet and venison co products in particular, for many reasons including: (i) the relatively small volume of production; (ii) the relatively large number of processors; (iii) lack of commitment to quality assurance and (iv) lack of investment in product collection, processing and market development.

The recent rationalisation of the deer processing industry means fewer processors have access to volumes of co products that are commercially saleable. Investment in the cooperative development of markets for value added velvet and venison co products could significantly improve the value of velvet antler and venison co products

Improvement in the value of these products will significantly improve returns to Australian deer farmers.

The project results suggest that collaborative supply of raw products, processing and development of markets for value added velvet and venison co products could improve grower returns and in turn make the industry attractive to new investors.

This report, a new addition to RIRDCs diverse range of almost 700 research publications, forms part of our Emerging Industries R&D program, which aims to identify important impediments to the development of a globally competitive Australian agricultural sector and support research that will lead to options and strategies that will remove these impediments.

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- downloads at www.rirdc.gov.au/reports/Index.htm
- purchases at www.rirdc.gov.au/eshop

Peter Core
Managing Director
Rural Industries Research and Development Corporation

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General

Australian deer farmers have long been envious of the apparently greater average return that New Zealand's deer farmers have realised for animals sold for venison processing. A proportion (not all) of that greater return is explained by differences (lower) in value of the New Zealand dollar compared to the Australian dollar.

There are many other factors that have contributed to the difference in returns, but one of the major factors is the, well documented, income that the New Zealand industry has earned from it ability to profitably process and market the co products of venison processing.

One of the major reasons for the consistently greater returns realised by New Zealand farmers from animals sold for slaughter is that New Zealand marketers have created ongoing, profitable demand for co products collected during animal processing. In the past, the many processors of Australian deer have been unable to separately market their small volumes of co products.

Generally speaking the lack of cooperation between the processors meant that there was an inability to pool co products to attract market interest so much of the co products were wasted or sold opportunistically The recent rationalisation of the deer processing industry has meant that fewer processors have access to volumes of co products that are commercially saleable. Improvement in the value of co products sourced from red deer and the creation of value for co products available from fallow and rusa deer will significantly improve returns to Australian deer farmers.

Although the estimated retail value of New Zealand sales and estimated potential value of Australian sales to specified tourist markets is significant, many farmers will look at the retail values for value added velvet and venison co products and mistakenly expect an extra purchase premium from purchasers. However the values assume that: (i) markets are developed and products collected can be sold and (ii) all co products collected from each animal processed are of sufficiently high quality to be processed for the market.

To successfully develop apparent market opportunities the Australian Deer Industry must work cooperatively to ensure the regular supply of marketable volumes, high quality product. The cooperative development of these apparent markets can lead to a direct increase (co product premium) in processors payments for livestock from the collection and sale of co products.

If the industry segregates and too many individuals or groups (more than 1 or 2) compete in their attempt to influence and service the apparent market, each small group is unlikely to be able to source, process and supply quantities of product that will sustain consumer interest. The lack of interest in sourcing product from a myriad of small suppliers will inevitably lead to fall in demand for Australian products and any co product premiums paid by processors of deer are likely to disappear.

Individual New Zealand businesses are already considering opportunities to development Australian inbound tourist markets for value added velvet and venison co products. It is important for the Australian deer industry to begin cooperative development of markets for value added velvet and venison co products immediately and probably in cooperation with New Zealand businesses in an attempt to create supply channels that can meet the potential demand for products and minimise unnecessary trans-Tasman competition.

As indicated in the application for project funds, during the period of this project (February 2000), Bilby International began paying small premiums directly to farmers for co products obtained from deer they have purchased as evidenced by purchase receipts.

Financial statistical information provided by Bilby International shows that from 17 January 2001 to 24 April 2001 it paid a total in excess of $9,000 to growers as `by product bonuses'.

Potential Tourist Demand

Estimates of average consumption of value added velvet antler and venison co products by Asian tourists to New Zealand transposed to estimates of the number of inbound Asian tourists to Australia, suggest that the potential demand for these products could be significant.

If the Australian deer industry is able to encourage only 20% of Asian tourists from China, Hong Kong, South Korea, Taiwan and Singapore to purchase a similar volume of velvet and venison co products that are estimated to be purchased by similar tourists visiting New Zealand, returns to industry could be in excess of $60 million (table 20).

However, the potential value of these sales does not include any estimation of marketing costs that are likely to be significant and will require significant investment. If the industry segregates and too many individuals or groups compete in their attempt to influence and service the apparent market, each small group is unlikely to be able to provide the required marketing investment, source, process and supply quantities of product that will sustain consumer interest.

The lack of interest in sourcing product from a myriad of small suppliers will inevitably lead to fall in demand for Australian products and any co product premiums paid by processors of deer are likely to disappear.

Subsequently retail tourist business that have been introduced to these products will look for suppliers that can consistently provide commercial volumes of quality products and that is likely to mean New Zealand businesses.

Potential Pet Demand

Given the massive spending on pet foods by people in Europe, North America and Australia and owners willingness to ensure that animals are properly cared for the market opportunities apparently offered by this sector appear significant.

In particular, information that continues to be generated, both anecdotal and scientifically researched, on the value of velvet antler and venison co products in treating animal ailments demonstrate the apparent opportunity to enter and develop these markets for the benefit of animals treated and the commercial expansion of the Australian Deer industry.

Marketing investment required to further investigate and develop this opportunity is likely to be significant.

Grower Returns

While data in table 18 suggests opportunities to improve grower returns by $0.11, $0.27 and $0.07 per kg hot carcase weight for fallow, red and rusa deer respectively, many farmers will look at the retail values for value added velvet and venison co products and mistakenly expect an extra purchase premium form purchasers. However the values assume that: (i) markets are developed and products collected can be sold and (ii) all co products collected from each animal processed are of sufficiently high quality to be processed for the market.

Although potential markets for product have been identified and accessed, not all available products are in demand by current markets.

Market development and the payment of premiums to farmers for co products collected assumes, that those involved in market development have the financial capability and the ability to accept risks associated with market development.

Market development involves financial risks linked to `up-front' investment associated with:

- Market assessment
- Employment of appropriately skilled staff
- Raw product purchase
- Variability in raw product quality
- Processing, packaging, storage and freight costs
- Aggregation of saleable stocks (consistency of supply)
- Development of demand
- Development of retail outlets

These `up-front' investments include considerable risks of investment loss from a range of variables including:

- Loss of initial product (markets are not developed before initial product passes use by dates)
- Variable supply of raw products
- Variable quality of raw products
- Inappropriate employment of staff
- Production, processing and marketing cost increase to minimise profit margins

Processing and Packaging

Much is already known about processing and packaging of all products and processing is likely to remain a specialist's domain. Although factories that process deer antler have idiosyncratic specialisations to produce products that meet client and marketing requirements, the principal processing techniques and objectives are similar, although the actual technique employed by different factories varies considerably.

Similarly, packaging requirements within specific market segments are similar although individual clients may have particular requirements. As commercial developments of `new' markets are investigated (Western Health Food Market and Western Pet Food Markets) ideal processing and packaging requirements must be developed.

Therapeutic Drugs Administration (TGA)

The requirement for TGA registration for encapsulated product is not definite although some TGA staff suggest that any encapsulated product is likely to require TGA registration before it is offered for sale. Any individual or company considering the sale of encapsulated deer velvet or venison co products in Australia should seek advice directly from the TGA.

It is worthwhile to note that Australian encapsulated products currently available for sale in Australia include deer antler, deer blood, deer liver and sheep placenta from more than one company.

The TGA does not provide advice on ANZFA regulatory requirements.

Australian and New Zealand Food Authority (ANZFA)

Representatives of ANZFA have suggested that non-encapsulated food product that: (i) conforms to ANZFA regulations, (ii) is processed in facilities that adhere to a well documented and maintained Good Manufacturing Practice, (iii) adheres to a Standard Operating Procedure and (iv) does not carry any specific or inferred health claims, does not need to be registered by the TGA.

However market research by this project reveals many products including deer blood, deer liver, deer antler and sheep placenta capsules that do not carry a TGA registration number are currently available to Australian consumers. Most, but not all, of these products do appear to meet ANZFA labelling requirements.

The ANZFA does not provide advice on TGA regulations.

Current Australian Market Sophistication

Our investigation of Australian tourist markets, in particular health food shops and Asian herbalist shops, suggests that this market sector's knowledge of the Australian deer industry generally and the availability of deer co-products specifically, is almost nonexistent.

There are some commercial outlets serviced by Australian companies that have limited knowledge of the Australian industry. However there has been little or no commercial development of these markets and the only promotional material available to retailers is that produced by New Zealand.

Product available for sale included material from New Zealand and other countries and sometimes, Australian product.

Other information gleaned from visits to retailers and potential retailers of deer co-products are confusing and appear to relate to either the retailer's clientele or, limited, previous experiences or both. For example some retailers suggested that deer antler powder was difficult to sell while others had the opposite view, some suggested that Asian buyers did not trust the content of encapsulated products while others held an opposing view.

Initial interest in Australian product is encouraging however development of a long-term, sustainable market is likely to require significant investment in both marketing programs and production systems that have an ability to guarantee regular supply of consistently high quality products.

Quality Assurance

Through its Committee for Proprietary Medicinal Products (CPMP), the European Agency for the Evaluation of Medicinal Products – Human Evaluations Unit is encouraging the concept of `Well Monitored Herds' to minimise risks of transmitting Animal Spongiform Encephalopathy (TSE) agents via medicinal products. They say that although the principal of well-monitored herds is attractive, implementation and policing need more consideration.

The attitude of the CPMP reflects the wider community concern about potential risks to human health from products that are used by humans as food, medicinal and other products. The implications for those involved in the production of products like those obtained from velvet antler and venison co-products are likely to be significant.

However well monitored quality assurance accreditation that provides consumers with safeguards required for food safety, animal welfare and animal husbandry issues would help guarantee market access for product. If fact, increasingly, quality assurance accreditation is becoming a minimum standard for market access rather than an extra standard for elite producers.

1. Introduction

Australia is a small player in the international velvet antler market. Although Australian production is growing steadily, it still only produces about 25 to 30 tonnes of green product annually compared to New Zealand production that exceeds 400 tonnes annually.

Although Korea controls the sale and movement of the majority of velvet antler marketed internationally and is a major consumer of product, New Zealand significantly influences the International velvet antler market. In recent years New Zealand companies have purchased (either directly or indirectly) a significant volume of Australia's annual production and anecdotal reports suggest at least 50% of the antler purchased from Australia is used in the production of velvet antler capsules and, although difficult to measure, an estimated 20% of the capsules produced are consumed by the New Zealand's domestic market.

Average farmer returns for red deer velvet sold by the Australian Deer Horn and Co products Pty Ltd (ADH) at its 1999/2000 pools was about $92.00/kg green. This equates to approximately $276/kg for dried product. The retail value of velvet antler capsules sold in Australia today varies from about $600/kg (Australian made product) to $1350/kg (imported New Zealand product).

Bilby International market and processing research suggests that at least two companies in New Zealand devote 100% of their processing capacity to producing velvet antler capsules, 50% of which are sold in New Zealand's domestic market.

The cultural origin of Australia's population is similar to that of New Zealand although it is reasonable to estimate that the number of people living in Australia that are from Asian backgrounds is greater than that for New Zealand. Australian Bureau of Statistics (ABS) reports show that in 1995/96, about 1.6 million overseas tourists visited Australia on packaged tours and of that number about 75% were of Asian origin. It is reasonable to estimate an increase in the number of similarly categorised tourists that will visit Australia in 2000/2001.

These considerations suggest that the likely domestic market for velvet antler products in Australia could be, at least as large as the New Zealand domestic market

One of the major reasons for the consistently greater returns realised by New Zealand farmers from animals sold for slaughter is that New Zealand marketers have created ongoing, profitable demand for co products collected during animal processing. In the past, the many processors of Australian deer have been unable to separately market their small volumes of co products. The recent rationalisation of the deer processing industry means a few processors will have access to volumes of co products that are commercially saleable. Improvement in the value of co products sourced from red deer and the creation of value for co products available from fallow and rusa deer will significantly improve returns to Australian deer farmers.

Keys to improving industry and individual producer returns from velvet antler and co products include: (i) development of markets for fallow deer velvet; (ii) the development and access of markets for co products, and; (iii) development of value added velvet antler and co products for the Australian domestic market.

Use of Deer Co Products in Traditional Chinese Medicine

There are many, difficult to trace, anecdotal references that report the use of deer co products in Traditional Chinese Medicine (TCM). However there are many references to the historic use of deer velvet and its inclusion in the ***Chinese medical pharmacopoeia*** since 168BC. Medicinal uses for deer velvet are also contained in the book, first published in the sixteenth century, called ***Ben Cao Gang Mu*** that is reported (Chen 2001) to have been referred to by Charles Darwin as `The Chinese Encyclopaedia. The uses for deer velvet and deer co products are also included in ***The Great Dictionary of Traditional Chinese Medicine.*** The Dictionary of Traditional Chinese Medicine is written in Chinese, however English translation of text from the dictionary (Chen 2001) describes the following TCM used for deer co products.

Antler Slices

Action	As a tonic to treat impotence, spermatorrhea, or frigidity and infertility, emaciation, lassitude, aversion to cold, dizziness, tinnitus, impairment of hearing, back pain accompanied by cold sensation, and weakness of the limbs, abnormal uterine bleeding, and leukorrhea, chronic sores difficult to heal.
Processing	Cut into slices, press, dry and pulverise
Usage	One to two grams to be ground into powder and taken after pouring liquid on it

Deer Pizzle

Action	As a tonic to nourish the kidneys, to reinforce the ‘Yang” and to assist in male sperm production and to treat fatigue or debility associated with long and exhaustive work, lassitude in the loin and legs, kidney deficiency, Tinnitus, male impotency or female infertility.
Processing	Cleanse, dipped in warm water, slice, baking, ground into powder.
Usage	Make a concoction of seven to twenty grams or as ordinary food administered simply after cooking.

Deer Tail

Action	As a tonic to treat acne, knee pain, lumbago, male impotency, spermatorrhoea, vertigo and tinnitus
Processing	Wash, slice and bake.
Usage	Make a concoction of seven to twenty grams and eat whole.

Deer Sinew

Action	As a tonic to strengthen the tendons and bones, recommended to those with rheumatism, joint pain and muscle spasms.
Processing	Cleanse, bake to soft and slice.
Usage	Use one hundred to two hundred grams to cook in a soup or boil.

Deer Blood

Action	As a tonic to treat weakness, blood supplement, lower back pain, palpitation, insomnia, lung diseases and women diseases.
Processing	Collect by slaughtering deer, dry by wind into purple/brown slice
Usage	Take as a pill or powder form, 1gm/day

Deer Meat

Action As a tonic to supplement the five internal organs, adjust the blood and pulse rate, treatment for weakness and thinness, treatment for lack of milk after pregnancy.

Estimated Australian Production of Velvet Antler and Venison Co Products

Bilby International (Chapman 2001) provided the following guide to average production of co products from red and fallow deer slaughtered in Australia.

Table 1. Estimated average production of co products

Product	Fallow	Red	Rusa
Tail (ea)		0.75 ***	1
Pizzle (kgs)	150	300	175
Sinews (kgs)	160	300	250
Blood (kgs)	1500	3000	
Heart (kgs)	250	500	

*** Not all tails from female red deer are suitable

Australian processed an estimated 16,000 red deer, 36,000 fallow deer and 4,000 rusa deer during the July 99 to June 2000 year. The estimated volume of co products that could have been produced from these animals is show in table 2.

Table 2. Estimated potential production of co product in 1999/2000

Product	Fallow	Red	Rusa
Tail (ea)		12,000	4,000
Pizzle (kgs)	2,700	2,400	350
Sinews (kgs)	5,760	4,800	1,000
Blood (kgs)	54,000	48,000	0
Heart (kgs)	9,000	8,000	0

2. Objectives

To improve returns to Australian deer farmers by target development of niche markets for venison co-products and value added velvet antler products.

1. Research and document ideal processing, packaging and handling technologies for Australian fallow deer velvet antler and venison co-products
2. Research market specification and likely demand from selected International and Australian domestic markets for value added deer antler and co-products
3. Develop and document sales strategies that will maximise domestic Australian market acceptability an availability for Australian deer industry co-products

Previously unachievable profits (from co product and value added sales) can be passed directly back to all deer producers while previously unrealised profits from the sale of fallow velvet antler and improved returns from the sale of value added velvet antler products can only improve deer farmer returns.

3. Methodology

Objective 1:

Two international companies in New Zealand that process significant volumes of deer antler for international and New Zealand's domestic market agreed to receive Bilby representatives to discuss ideal processing and packaging of deer antler.

These and other companies in New Zealand and Australia were visited to source information for inclusion in this report for industry on recommended processing and packaging techniques for velvet antler and co products processed for domestic markets in New Zealand that can be adopted for Australian product destined for Australian domestic markets.

Objective 2:

Bilby International has confidential market intelligence suggesting a potential demand for ideally harvested, processed and packaged fallow deer velvet. Market requirements including specific harvesting, processing, packaging and presentation requirements for fallow deer velvet antler will be determined in consultation with consumers and promulgated to fallow deer farmers.

Objective 3:

Steps to developing demand for venison co products and velvet antler include identifying regularly used Asian tourist itineraries and the shopping habits of the tourists. With help of existing business contacts, phone and electronic contact will be made into potential clients to investigate their interest and determine specific product, processing, cutting, packaging and presentation requirements.

Preference for product from particular breeds will be assessed to identify specific breed opportunities.

This phase of the project will investigate potential product demand patterns and volumes and will involve travel to personally meet with potential clients. During visits to these markets, evaluation of competition, particularly from New Zealand product will be undertaken to establish their product positioning strategies and any branding success.

Improved returns for Australian growers will be clearly demonstrated by Bilby International. After establishment of initial markets, (approximately three months into the project) Bilby will provide detailed information on client invoices that will demonstrate additional farmer income (above the HSCW price for venison) derived from sale of co-products obtained from each animal processed.

4. Results

Objective 1 - Co Product Processing and Packaging

Velvet Antler

The primary aim of all velvet antler drying is simply to remove water from velvet (New Zealand NZMAF specifications for dried velvet antler indicate that dried velvet must contain 85% total solids). Factories that process deer antler have idiosyncratic specialisations to produce products that meet client and marketing requirements, the principal processing techniques and objectives are similar, although the actual technique employed by different factories varies considerably.

Broad guides to the principles of velvet antler processing are:

Factory Drying

1. Purchased frozen velvet arrives at the factory.
2. The velvet is graded, (mostly according to size and so the need for differential cooking time), the cut end of the velvet is sealed and velvet is placed in the freezer.
3. It is placed on temporary racks and allowed to thawed overnight
4. The next morning and the velvet sticks are placed on racks for water bath cooking.
5. Each stick of velvet is dipped in the water cooker several times. After appropriate dipping sticks are ready for the dryer.
6. The velvet is placed back on oven racks and allowed to cool.
7. The racks are placed in the oven and the velvet is cooked.
8. The internal temperature of the velvet is tracked during cooking to ensure pasteurisation.
9. After cooking the velvet is allowed to cool.
10. After cooling racks are returned to the drying room where the velvet stays until it is dried.
11. Prior to slicing the hair is removed.

Air Drying

1. Velvet is bought frozen
2. Before processing it is thawed in the open air and then washed with water and detergent using a soft brush.
3. The cut end of the velvet is sealed (cauterised) on a hot plate.

Processing step A

4. The whole stick of velvet is dipped in boiling water for a few minutes (if it remains in the water for too long the velvet will split).
5. The velvet is cooled to room temperature.
6. Steps 4.1 and 4.2 are repeated a several times (until the protein is fixed).

Processing step B

7. The velvet is then placed in a hot oven for several hours. The time in the oven is dependent on the degree of calcification of velvet sticks.
8. The velvet is dried at room temperature.
9. Steps 5 and 6 are repeated several times (four to five times) depending on the weather (drying) and size of each velvet stick.

Vacuum drying

1. Frozen velvet is removed from the freezer
2. Velvet is placed (tied) on racks with the cut end up to minimise blood loss during cooking and thawed overnight.
3. After thawing racks holding the velvet are placed in drying rooms where the cooling system is reversed and set to heat to thaw it.
4. Then the temperature is reduced and the velvet is held it in the drying room until it is semi dried.

5. After an appropriate time the velvet is placed in a vacuum dryer until it completely dry.

Vacuum drying is not considered appropriate for product intended for slicing (it crumbles as the product becomes too dry) however product produced by vacuum drying generally has lower bacterial counts than product dried in other ways.

Low bacterial counts are particularly important where the velvet is to be used in capsules as the powder is the end use product and unlike other forms of dried antler, it will not receive any further treatment that can assist bacterial control.

Pizzles

Deer pizzles, with the testicles still attached, arrive either fresh or frozen at the processing works. Frozen product must be thawed before processing is initiated.

1. The testicles are removed from the pizzle and dried separately, but in close association with the pizzle.
2. The foreskin of the pizzle is `Set'.
3. The pizzles and testicles are separately cooked in boiling water
4. Pizzles are placed on racks and put into the drying room.
5. The testicles are sewn together and are sewn onto the shaft of the penis in their `normal' location in a manner that ensures air movement around each testis.
6. Testicles shrivel up after a few days.
7. One of the main (and most difficult) skills in drying pizzles is to achieve a dark coloured product at the end of drying.

Tails

1. Tails are dried slowly in the drying room.
2. They require considerable, ongoing, manual input to manipulate and shape the tail during drying.
3. The value of each tail is determined individually and components that contribute to value include overall size, weight, shape and colour.

Sinews

1. Sinews are washed prior to processing
2. Each sinew is held straight for the first two to three days of the drying process
3. All sinews are air dried
4. Sinew quality is particularly related to the golden colour developed during drying.

Objective 2 – Potential Market Demand and Requirements

There are several indicators of potential demand for processed velvet antler and venison co products. One indicator is the market price obtained by retailers and wholesalers (particularly in New Zealand) for finished products. Data in table 3 was obtained by personal contact with individual companies and marketing/sale promotional material from various other sources including the Internet.

Table 3. Indicative co product sale prices

Data in table 3 is based on a Australian/New Zealand dollar exchange rate of AUD$1.00 = **NZ$1.30** with a simultaneous US/New Zealand exchange rate of NZ$1.00 = **USD$0.42**

Product	Capsules		Total weight (container or whole) (gms)	*Cost NZ$*				Cost AUD$			
	No Per Bottle	Weight (mg)		*Total*	*Per capsule*	*Per Kg*	*Per Gram*	Total	Per capsule	Per Kg	Per Gram
Velvet Capsules	60	200	12	*$40.00*	*$0.67*	*$3,333*	*$3.33*	**$30.77**	**$0.51**	**$2,564**	**$2.56**
	120	200	24	*$36.00*	*$0.30*	*$1,500*	*$1.50*	**$27.69**	**$0.23**	**$1,154**	**$1.15**
	90	200	18	*$38.50*	*$0.43*	*$2,139*	*$2.14*	**$29.62**	**$0.33**	**$1,645**	**$1.65**
	100	150	15	*$8.00*	*$0.08*	*$533*	*$0.53*	**$6.15**	**$0.06**	**$410**	**$0.41**
	60	200	12	*$25.50*	*$0.43*	*$2,125*	*$2.13*	**$19.62**	**$0.33**	**$1,635**	**$1.63**
	60	200	12	*$77.76*	*$1.30*	*$6,480*	*$6.48*	**$59.81**	**$1.00**	**$4,984**	**$4.98**
	100	500	50	*$105.91*	*$1.06*	*$2,118*	*$2.12*	**$81.47**	**$0.81**	**$1,629**	**$1.63**
	100	500	50	*$129.48*	*$1.29*	*$2,590*	*$2.59*	**$99.60**	**$1.00**	**$1,992**	**$1.99**
	50	350	17.5					**$22.00**	**$0.44**	**$1,257**	**$1.26**
	60	200	12	*$15.00*	*$0.25*	*$1,250*	*$1.25*	**$11.54**	**$0.19**	**$962**	**$0.96**
Sliced Velvet			75	*$120.00*		*$1,600*	*$1.60*	**$92.31**		**$1,231**	**$1.23**
			75	*$80.00*		*$1,067*	*$1.07*	**$61.54**		**$821**	**$0.82**
			75	*$100.00*		*$1,333*	*$1.33*	**$76.92**		**$1,026**	**$1.03**
			75	*$60.00*		*$800*	*$0.80*	**$46.15**		**$615**	**$0.62**
			75	*$20.00*		*$267*	*$0.27*	**$15.38**		**$205**	**$0.21**
			75	*$15.00*		*$200*	*$0.20*	**$11.54**		**$154**	**$0.15**
	A					*$5,800*	*$5.80*			**$4,462**	**$4.46**
	B					*$3,950*	*$3.95*			**$3,038**	**$3.04**
	C					*$3,150*	*$3.15*			**$2,423**	**$2.42**
	D					*$1,800*	*$1.80*			**$1,385**	**$1.38**
	General		38	*$153.00*		*$4,026*	*$4.03*	**$117.69**		**$3,097**	**$3.10**
	Tip		38	*$85.00*		*$2,237*	*$2.24*	**$65.38**		**$1,721**	**$1.72**
	Middle Stick		38	*$40.00*		*$1,053*	*$1.05*	**$30.77**		**$810**	**$0.81**
	Tip		75	*$220.00*		*$2,933*	*$2.93*	**$169.23**		**$2,256**	**$2.26**
	Middle Stick		75	*$60.00*		*$800*	*$0.80*	**$46.15**		**$615**	**$0.62**

Pizzle Capsules	90	150	13.5	*$48.50*	*$0.54*	*$3,593*	*$3.59*	**$37.31**	**$0.41**	**$2,764**	**$2.76**
	100	120	12	*$11.00*	*$0.11*	*$917*	*$0.92*	**$8.46**	**$0.08**	**$705**	**$0.71**
	60	200	12	*$77.76*	*$1.30*	*$6,480*	*$6.48*	**$59.81**	**$1.00**	**$4,984**	**$4.98**
	60	150	9	*$15.00*	*$0.25*	*$1,667*	*$1.67*	**$11.54**	**$0.19**	**$1,282**	**$1.28**
	24			*$69.04*	*$2.88*			**$53.11**	**$2.21**		
Pizzle Whole			52	*$48.40*		*$931*	*$0.93*	**$37.23**		**$716**	**$0.72**
						$375	*$0.38*			**$288**	**$0.29**
	< 40 gms		35	*$14.00*		*$400*	*$0.40*	**$10.77**		**$308**	**$0.31**
	40 - 60 gms		50	*$36.00*		*$720*	*$0.72*	**$27.69**		**$554**	**$0.55**
	60 - 100 gms		80	*$52.00*		*$650*	*$0.65*	**$40.00**		**$500**	**$0.50**
	> 100gms		120	*$65.00*		*$542*	*$0.54*	**$50.00**		**$417**	**$0.42**
Blood Capsules	120	450	54	*$38.00*	*$0.32*	*$704*	*$0.70*	**$29.23**	**$0.24**	**$541**	**$0.54**
	450	450	202.5	*$140.00*	*$0.31*	*$691*	*$0.69*	**$107.69**	**$0.24**	**$532**	**$0.53**
	900	450	405	*$250.00*	*$0.28*	*$617*	*$0.62*	**$192.31**	**$0.21**	**$475**	**$0.47**
	90	200	18	*$25.50*	*$0.28*	*$1,417*	*$1.42*	**$19.62**	**$0.22**	**$1,090**	**$1.09**
	100	200	20	*$10.00*	*$0.10*	*$500*	*$0.50*	**$7.69**	**$0.08**	**$385**	**$0.38**
	60	200	12	*$46.34*	*$0.77*	*$3,862*	*$3.86*	**$35.65**	**$0.59**	**$2,971**	**$2.97**
	50	500	25	*$12.25*	*$0.25*	*$490*	*$0.49*	**$9.42**	**$0.19**	**$377**	**$0.38**
Tail Capsules	90	150	13.5	*$48.50*	*$0.54*	*$3,593*	*$3.59*	**$37.31**	**$0.41**	**$2,764**	**$2.76**
	100	130	13	*$18.00*	*$0.18*	*$1,385*	*$1.38*	**$13.85**	**$0.14**	**$1,065**	**$1.07**
	60	150	9	$15.00	$0.25	$1,667	$1.67	**$11.54**	**$0.19**	**$1,282**	**$1.28**

Tail Whole		Range (gms)	Average (gms)								
		30-40	35	*$24.50*		*$700*	*$0.70*	**$18.85**		**$538**	**$0.54**
		40-50	45	*$36.00*		*$800*	*$0.80*	**$27.69**		**$615**	**$0.62**
		50-60	55	*$52.25*		*$950*	*$0.95*	**$40.19**		**$731**	**$0.73**
		60-70	65	*$78.00*		*$1,200*	*$1.20*	**$60.00**		**$923**	**$0.92**
		70-80	75	*$97.50*		*$1,300*	*$1.30*	**$75.00**		**$1,000**	**$1.00**
		20-30	25	*$17.00*		*$680*	*$0.68*	**$13.08**		**$523**	**$0.52**
		30-40	35	*$24.00*		*$686*	*$0.69*	**$18.46**		**$527**	**$0.53**
		40-50	45	*$50.00*		*$1,111*	*$1.11*	**$38.46**		**$855**	**$0.85**
		50-60	55	*$83.00*		*$1,509*	*$1.51*	**$63.85**		**$1,161**	**$1.16**
		60-70	65	*$108.00*		*$1,662*	*$1.66*	**$83.08**		**$1,278**	**$1.28**
		70-80	75	*$138.00*		*$1,840*	*$1.84*	**$106.15**		**$1,415**	**$1.42**
		>80	85	*$175.00*		*$2,059*	*$2.06*	**$134.62**		**$1,584**	**$1.58**
Sinews	Whole					*$65*	*$0.07*			**$50**	**$0.05**
	60	200	12	*$54.19*	*$0.90*	*$4,516*	*$4.52*	**$41.69**	**$0.69**	**$3,474**	**$3.47**
	Whole			*$26.00*				**$20.00**			
	Cut			*$45.00*				**$34.62**			

Averaged Co Product Sale Prices

Data in table 4 below was determined from information provided in table 3 above.

Table 4. Averaged Co Product Sale Prices

Product	Price	Per Gram	Per Kg	Per Capsule
Velvet Capsules	Max	$4.98	$4,984	$1.00
	Min	$0.41	$410	$0.06
	Average	$1.82	$1,823	$0.49
Sliced Velvet	Max	$4.46	$4,462	
	Min	$0.15	$154	
	Average	$1.59	$1,591	
Pizzle Capsules	Max	$4.98	$4,984	$2.21
	Min	$0.71	$705	$0.08
	Average	$2.43	$2,434	$0.78
Pizzle Whole	Max	$0.72	$716	
	Min	$0.29	$288	
	Average	$0.46	$464	
Blood Capsules	Max	$2.97	$2,971	$0.59
	Min	$0.38	$377	$0.08
	Average	$0.91	$910	$0.25
Tail Capsules	Max	$2.76	$2,764	$0.41
	Min	$1.07	$1,065	$0.14
	Average	$1.70	$1,704	$0.25
Tail Whole	Max	$1.58	$1,584	
	Min	$0.52	$523	
	Average	$0.93	$929	

Table 5. Guide to average sale value of co products

Product	Average sale value
Velvet	$1,707
Pizzle	$1,449
Blood	$910
Tails	$1,316
Sinews	$1,762

Processing costs

Estimated average processing costs (Hamer 2001) are provided in tables 6 to 10. Costs of producing powdered, non-encapsulated products include: freeze drying, grinding to powder with particles size of 250 microns and packing into 2.0kg vacuum packs. Costs of providing encapsulated products also include: gelatine capsules, containers for capsules, labels for containers and required test certification certificates.

A 5% loss factor must be added to the encapsulation processing cost although the loss rate is likely to be less than 5% for large volume production runs. Similarly, there is an estimated 5% loss during milling from frozen product to powdered product.

Table 6 Guide to air-drying costs

Product	Cost (AUD$)
Antler	$20.00/kg
Pizzles	$6.50/kg
Sinews	$2.50/kg
Tails	$10.00ea

Table 7 Guide freeze-drying costs

Product	Cost (AUD$)
Antler	$17.00/kg
Pizzles	$14.50/kg
Sinews	$18.00/kg
Tails	$14.50/kg
Blood	$4.50/kg

Table 8A. Summary of Estimated Processing cost for powder and capsule products

Product	Encapsulation per 1000 capsules			Powder required (gm)	Milling loss	Freeze dried product required (gms)	Freeze drying				Fresh Weight (gm)
	Weight (mg/cap)	Cost	Loss				Cost ($/kg fresh)	Dry Product Yield	Cost ($/kg dry)	Actual cost ($)	
Velvet	**350**	$16.00	5%	**368.4**	5%	**387.8**	$ 17.00	33%	$51.52	$19.98	**1175.2**
Pizzles	**350**	$16.00	5%	**368.4**	5%	**387.8**	$ 14.50	90%	$16.11	$ 6.25	**430.9**
Sinews	**350**	$16.00	5%	**368.4**	5%	**387.8**	$ 18.00	75%	$24.00	$9.31	**517.1**
Tails	**350**	$16.00	5%	**368.4**	5%	**387.8**	$ 14.50	75%	$14.33	$ 7.59	**517.1**
Blood	**350**	$16.00	5%	**368.4**	5%	**387.8**	$ 4.50	20%	$22.50	$8.73	**1939.1**
CODE	**[A]**	**[B]**	**[C]**	**[D]**	**[E]**	**[F]**	**[G]**	**[H]**	**[I]**	**[J]**	**[K]**
FORMULA				**[A/(1-C)]**		**[D/(I-E)]**			**[G/I]**	**[I*F/1000]**	**[F/H]**

Table 8B. Summary of Estimated Processing cost for powder and capsule products

Product	Total cost of powder ($/kg)		Total capsule cost			
	Dry product	Fresh product	$/1000 capsules	$/capsule	$/kg Dry product	$/kg Fresh product
Velvet	$ 51.52	$ 17.00	$ 35.98	$ 0.0360	$ 92.77	$ 30.61
Pizzles	$ 16.11	$ 14.50	$ 22.25	$ 0.0222	$ 57.37	$ 51.63
Sinews	$ 24.00	$ 18.00	$ 25.31	$ 0.0253	$ 65.26	$ 48.94
Tails	$ 14.33	$ 14.50	$ 23.50	$ 0.0235	$ 60.59	$ 45.44
Blood	$ 22.50	$ 4.50	$ 24.73	$ 0.0247	$ 63.76	$ 12.75
CODE	**[I]**	**[G]**	**[L]**	**[M]**	**[N]**	**[O]**
FORMULA			**[B+G]**	**[L/1000]**	**[L/F*1000]**	**[L/K*1000]**

Table 9. Estimated total cost of powder production (initial purchase plus processing)

Product	Fresh product Costs		
	Purchase $/kg	Processing $/kg	Total $/kg
Velvet	$ 65.00	$ 17.00	$ 82.00
Pizzles	$ 16.00	$ 14.50	$ 30.50
Sinews	$ 6.50	$ 18.00	$ 24.50
Tails	$ 14.50	$ 14.50	$ 29.00
Blood	$ 3.00	$ 4.50	$ 7.50

Table 10. Estimated cost of 350 mg capsule production (initial purchase plus processing)

Product	Fresh product			Product cost $/capsule	Processing cost $/capsule	Total cost $/capsule
	$/kg	Gm per 1000 capsules	Cost/1000 capsules			
Velvet	$65.00	1175.2	$76.39	$0.076	$0.0360	$0.112
Pizzles	$16.00	430.9	$6.89	$0.007	$0.0222	$0.029
Sinews	$6.50	517.1	$3.36	$0.003	$0.0253	$0.029
Tails	$14.50	517.1	$7.50	$0.007	$0.0235	$0.031
Blood	$3.00	1939.1	$5.82	$0.006	$0.0247	$0.031

Asian Tourism to Australia

The cultural origin of Australia's population is similar to that of New Zealand although it is reasonable to estimate that the number of people living in Australia that are from Asian backgrounds is greater than that for New Zealand. Australian Bureau of Statistics (ABS) reports (McLennan 2000) show that in 1995/96, about 1.6 million overseas tourists visited Australia on packaged tours and of that number about 75% were of Asian origin. It is reasonable to estimate an increase in the number of similarly categorised tourists that will visit Australia in 2000/2001.

These considerations suggest that the likely domestic market for velvet antler products and venison co products in Australia could be significant. Data from the ABS (McLennan 2000) shows that the 0.547 million tourists of non Japanese Asian origin that visited Australia during 1995/96 paid a total of AUD$292.1 million dollars for their Australian content of their tours (an average of about $533 per person) including coach transfers, accommodation, meals, cruises, etc.

Forecasts presented by the Tourism Forecasting Council on the Department of Industry Science and Tourism (DIST) web site (***www.tourism.gov.au***) for the period 2000 to 2010 are summarised below: Data for Japan is not included below because the Japanese are not considered large consumers of deer velvet and co products. Summary estimates of inbound tourism from specific Asian countries are provided in table 11.

China

- The DIST considers that outlook for this market is strong for several reasons that include sustained economic growth, the recent implementation of 'Approved Destination Status' (ADS) for Australia and the Sydney Olympic games.
- The number of Chinese visitors is expected to increase by 25.2 per cent a year over the forecast period, to 1.1 million by the end of 2010.
- In 2001, approximately 163,000 Chinese visitors are expected in Australia, an increase of 32 per cent over 2000.

Hong Kong SAR (Special Administrative Region)

- The long-term outlook for this market is positive, largely due to an expected growth in its economy, the return of consumer confidence and the considerable media coverage of the Sydney Olympic games.
- The number of visitors from Hong Kong is forecast to increase by 6.4 per cent a year, from 140 000 in 1999 to 278,000 in 2010.
- In 2001, approximately 161,000 visitors from Hong Kong are expected in Australia, an increase of 7 per cent over 2000

South Korea

- The monetary and fiscal measures undertaken by the government of South Korea have resulted in rapid economic recovery and a rebuilding of consumer confidence lost during the Asian economic crisis.
- As a result, the number of Korean visitors is expected to increase by an average 18.3 per cent a year over the forecast period, to around 689,000 in 2010.
- In 2001, approximately 187,000 visitors from South Korea are expected in Australia, an increase of 14.6 per cent over 2000.

Taiwan

- Although this market has been contracting for the last three years, the market is expected to return to growth from 2001 onwards, largely due to strong economic growth, a favourable exchange rate and the Sydney Olympic games induced visitation.
- The number of visitors from Taiwan is forecast to increase by an average annual rate of 4.3 per cent over the forecast period, from 148,000 in 1999 to 235,000 in 2010.
- In 2001, approximately 150,000 visitors from Taiwan are expected in Australia, an increase of 6.5 per cent over 2000.

Singapore

- Although Singaporeans' travel preferences are changing from long-haul and exotic destinations to short-haul destinations within the Asian region, Australia is expected to maintain its position in the Singapore market with its reputation as a ‘western' destination, competitive pricing and a clean and attractive environment.
- The number of visitor arrivals from Singapore is forecast to increase by an average 5.5 per cent a year over the forecast period, from 267,000 in 1999 to 480,000 in 2010.
- In 2001, approximately 299 000 visitors from Singapore are expected in Australia, an increase of 9.6 per cent over 2000.

Table 11. Summary estimates of inbound tourism from specific Asian countries

Country	Estimated inbound tourists	
	2001	2010
China	163,000	1,100,000
Korea	187,000	689,000
Hong Kong	161,000	278,000
Taiwan	150,000	235,000
Singapore	199,000	480,000
Total	**960,000**	**2,782,000**

Asian Tourism to New Zealand

Approximately 1.5 million tourists visit New Zealand annually. About 450,000 of those tourists originate from Asia. The estimated number of specific Asian tourists that visited New Zealand in 2000 is shown in table 12.

Table 12. Estimated number of tourists from China, Korea Hong Kong, Taiwan and Singapore that visited New Zealand in 2000 (NZ govt 2001)

Country	Estimated inbound NZ tourists 2000
China	35,000
Korea	71,000
Hong Kong	32,000
Taiwan	44,500
Singapore	38,000
Total	**220,500**

Estimated Annual production of venison co products per animal in New Zealand assuming annual slaughtering of 400,000 deer, with 50% in each sex group, is shown in table 12.

Table 13. Estimated Annual production of venison co products per animal in New Zealand

Sex	Tails	Pizzles (kgs)	Sinews (kgs)	Blood (kgs)
Male	1.0	0.300	0.350	4.0
Female	1.0		0.350	4.0
Total Production	**400,000**	**60,000**	**140,000**	**20,000 *****

*** Total production of frozen blood is estimated at 20 tonnes that produces 4 to 5 tonnes (average 4.5 tonnes) of dried product of which 3 to4 tonnes (average 3.5 tonnes) is exported.

New Zealand estimates (Hamer 2001) suggest that approximately 10% of all venison co products produced in New Zealand are sold through the New Zealand tourist trade.

Table 14. Estimated Annual production of venison co products sold to tourists annually in New Zealand

Tourist sales	Tails	Pizzles (kgs)	Sinews (kgs)	Blood (kgs)
	40,000	12,000	14,000	3,500 ***

Based on estimates of the number of Asian tourists that visit New Zealand annually, the estimated volume of co products produced annually in New Zealand and estimates of the volume of co products sold annually to Asian tourists, the average volume of product purchased by Asian tourists who visit New Zealand can be estimated.

Assuming that 75% of all deer antler and co product purchases made in New Zealand by Asian tourists are made by those from China, Korea Hong Kong, Taiwan and Singapore, estimates of average, product purchases per tourist have been made and are shown in table 15.

Table 15. Estimates of average consumption of co products in New Zealand by tourists from China, Korea Hong Kong, Taiwan and Singapore

Tourist sales	Tails	Pizzles (kgs)	Sinews (kgs)	Blood (kgs)
	0.136	0.020	0.048	0.012

Therapeutic Goods Administration (TGA)

Any goods that are sold within Australia that carry either direct or indirect therapeutic claims must be registered by the TGA. However the classification of products as either a therapeutic good or food supplement is not clear-cut and the assessment of products includes and assessment of intake recommendations, pricing, underlying assumptions inferred by promotional material etc.

Discussion with representatives of the Food Section of the Australian and New Zealand Food Authority (ANZFA) and a representative of the ANZFA/TGA Interface committee have suggested that, at least for the immediate time, encapsulated products are unlikely to considered foods and so are most likely to require TGA registration before they can be legally offered for sale.

The suggestion that encapsulated deer co products are most likely to require TGA registration before they can be legally offered for sale is of concern as an investigation of the Australian market reveals that Australian made products that do not carry a TGA registration number and are currently available to Australian consumers includes: ***deer blood, deer liver, deer antler and sheep placenta capsules***.

Contact with the TGA is worthwhile before developing any encapsulated product for sale.

Some products observed and available for purchase in Chinese herbalist shops throughout Australia, for example sheep placenta capsules, did not appear carry any direct or indirect therapeutic claims on the product packaging. However, there were pamphlets available in association with the packaged product that only carried Chinese text. Translation of the text by project researchers revealed claims about the products that appeared to be therapeutic.

Our investigations also suggest that some products used in Traditional Chinese Medicine, imported directly from some Asian countries in packaging that carries only Chinese text, is being imported as food supplements. However the Asian consumers know the products well and the Chinese information included with the packaging of the products clearly states the traditional therapeutic uses for the products.

There are some different regulations that relate to the sale of encapsulated products by qualified Doctors of Traditional Chinese Medicine through the Traditional Chinese Medicine Association.

Data available from the TGA Internet web site suggests that processors may be able to apply for a TGA Listed Product Number for products destined for solely export.

It seems likely that the ANZFA and the TGA will continue to develop regulations that particularly relate to complimentary health products like those produced from deer so that a standardised approach to product use is consistently applied in both Australia and New Zealand.

Australian and New Zealand Food Authority (ANZFA)

Representatives of ANZFA have suggested that non-encapsulated food product that: (i) conforms to ANZFA regulations, (ii) is processed in facilities that adhere to a well documented and maintained Good Manufacturing Practice, (iii) adheres to a Standard Operating Procedure and (iv) does not carry any specific or inferred health claims, does not need to be registered by the TGA.

Major considerations for product to be considered a food by ANZFA are that the product must be presented as a food and have a tradition of use as a food in the form that it is presented to consumers. All ingredients of the product must also be foods. ANZFA regulations require that product labelling meets its standard requirements and that labels do not carry any specific or inferred

health claims. On this basis, it appears that Australian co products (tails, sinews, etc) that are hygienically collected, stored and transported from an approved abattoir to an approved processing facility can be sold in Australia.

However, telephone advice from ANZFA representatives also indicated that encapsulation of products for sale provided an inference to consumers that the product provided some therapeutic health benefits. By definition, this inference of suggests that encapsulated products are most likely to require registration by the TGA before sale. However as discussed under the TGA above, encapsulated products that do not have either a TGA registration or listing number and are made in Australia are available for sale in Australia.

On this basis, it appears that whole co products (tails, sinews, etc) and powdered but not encapsulated co products can be sold in Australia without need for TGA registration although by definition, to qualify as a food the product must be presented as a food and have a tradition of use as a food in the form that it is presented to consumers

The ANZFA does not provide advice on TGA regulations.

Pet Markets

Although the pet markets in Europe, North America and Australia market for velvet antler and co products have received little attention, there is a slowly growing recognition of the market potential, particularly for velvet antler.

Ewashkiw et al (2000) and Kamen et al (1999) discuss anecdotes of positive responses by animals fed velvet antler.

Table 16. Guide to the size and value of some pet food markets

	Approximate value of pet food sales	
Market	Value	Value (AUD$)
USA	$10.5 billion	$19.3 billion (marketresearch com 2001)
UK	£750 million	$ 2.0 billion (Jones 2001)
Australia	$1.6 billion	$ 1.6 billion (petnet.com 2001)
Total		**$22.9 billion**

Jones (2001) reports that, “the advent of the specialist pet superstores has created a new dimension in pet food retailing, giving the consumer more choice and the benefits of one-stop shopping. The specialist outlets, e.g. veterinary practices, have also been given a boost by the increasing popularity of healthy pet products, such as scientifically formulated varieties”. Specialist stores also provide health food products and `pet treats’ and the estimated vale of this sector of the market alone in the UK is about £90 million (AUD$240 million).

The pet care industry is reported to be one of Australia’s largest industries (Petnet.com 2001).

Reports of future prospects for the pet food trade in major western economies look extremely bright. Included in most forecasts are strong references to the increasing size and value of health products for pets and the increasing desire of pet owners to seek natural alternatives to drug treatments for health problems of their pets (eg arthritis).

Given the massive spending on pet foods by people in Europe, North America and Australia and owners willingness to ensure that animals are properly cared for the market opportunities apparently offered by this sector appear significant.

In particular, information that continues to be generated, both anecdotal and scientifically researched, on the value of velvet antler and venison co products in treating animal ailments (Kamen and Kamen 1999) demonstrate the apparent opportunity to enter and develop these markets for the benefit of animals treated and the commercial expansion of the Australian Deer industry.

Objective 3 – Sales Strategies

Australian Tourism Export Council

The Australian Tourism Export Council (ATEC) has a primary role to `Optimise the business success of members so that the resulting economic and social impact of tourism exports for Australians is maximised'. In January 2001 ATEC boasted a membership of approximately 950 members including inbound tour operators, accommodation providers, food and beverage outlets and tourism services.

ATEC provides members with many options including marketing opportunities, business development seminars, networking opportunities and business advice.

This project has subscribed the Deer Industry Association of Australia (DIAA) as a member of ATEC and information provided by ATEC is available to any business involved in the deer industry through the DIAA.

Suggested Strategies

Information obtained by this project suggests that until TGA registration requirements related to encapsulated products are determined, manufactures and marketers that do not have TGA registration related to encapsulated deer co-products, should concentrate on manufacture and processing of other than encapsulated products.

A collective approach, from those involved in processing Australian deer co-products, to seek a `Listing' registration for deer co-products may be worthy of consideration if commercially feasible.

Initial Marketing Considerations

Initial considerations for the development of sustainable domestic Australian deer co-product markets include:

- Target inbound Asian tourists in Brisbane, The Gold Coast, Sydney and Melbourne (via ATEC) who have understanding of reputed health benefits so require no material that promotes and advertises health benefits
- Production of powdered product (bottled)
- Production of whole dried products
- Use of Asian style packaging
- Use of people of appropriate Asian origin as the face of sales
- Development of confidence in the Australian industry's capability of supply and consistency in quality
- Use of Australian Deer Velvet Quality Mark as an industry sign of quality

- Investment in development and production of promotional and marketing brochures that support sales

Future Marketing Considerations

Future considerations for the development of sustainable domestic Australian deer co-product markets include:

- Broaden the target markets for inbound Asian tourists via ATEC
- Target resident Asians and Western people seeking alternative or Traditional Chinese Medicines
- Target Health Food Shops
- Consideration of a collective approach to the TGA for a `Listing' registration for encapsulated deer co-products
- Production of promotional material
- Production of encapsulated products (TGA approval needed)
- Powdered product (bottled)
- Whole dried products
- Asian style packaging
- Asian face to sales
- Confidence of capability of supply and consistent quality
- Australian Deer Velvet Quality Mark
- Investment in future research projects and collaboration with New Zealand researchers.

5. Discussion

Asians and Chinese in particular have a different perspective of most things in the world than the majority of people of European descent. However that situation is changing as more people look to therapies and treatments that are natural (non chemical) non prescriptive, relieve symptoms and balance body functions to allow healthy lifestyles.

Several Chinese beliefs that support the differences of perspective between Chinese and Western cultures are (Chen 2001): `A belief that there is no problem that god has created for which there is no natural cure', 'The grass that grows on a man's grave could have cured the ailment that caused his death' and 'When a Western person sees a plant they grow it and water it and enjoy its beauty, when a Chinese person sees a plant they think of cooking it and eating it for their health'.

The Chinese successful approach to human health has been practiced for in excess of three thousand years and in only recent times are Western people beginning to accept that there are reasonable alternatives to Western approaches to human health. Although not all Traditional Chinese Medicines are likely to be accepted or offer benefit to all people and cannot always be supported by statistical research assessments, surely statistical analysis is only a necessary replacement to long drawn out time consuming and delaying trials and assessments. Traditional Chinese Medicine has withstood the test of time and so should be more objectively considered.

However demand for such products produced in Australia's deer industry, the transient Asian tourist population is likely to be able to consume all of the industry's production without consideration of the small but growing demand from Western Societies.

Returns for velvet

Average farmer returns for red deer velvet sold by the Australian Deer Horn and Co products Pty Ltd (ADH) at its 1999/2000 pools was about $92.00/kg green. This equates to approximately $276/kg for dried product. The retail value of velvet antler capsules sold in New Zealand, Australia and the USA varies from about $410/kg to $1823/kg (see table 4).

The data presented in tables 4 and 5 suggests that provided appropriate markets are identified, opportunities exist to increase returns for velvet antler by processing some product into powder for direct sale to consumers and to sell whole and sliced stick of antler directly to consumers.

There appear to be opportunities to establish specific tourist market outlets for processed velvet in Australia provided the purchaser/processor of the velvet has sufficient cash flow to carry processing costs until product is sold. It is unreasonable for potential processors to expect producers to carry the risks of processing by not receiving payment for raw product until processed product is sold, while the processors carry the relatively small processing risk.

However it is unlikely that the Australian industry produces enough velvet antler to support more than one or two outlets.

Returns for co products

A guide to prices ($/kg) currently achievable by Australian processors (Chapman 2000) for deer co products should regular supplies of consistent quality products be available for sale, and markets for all product be identified is shown in table 16.

Table 17. Estimated value of saleable volumes of quality co products assuming market availability (Chapman 2001)

Item	Red deer	Fallow deer	Rusa deer
Tails ($ ea)	$10.00		$ 1.00
Pizzles ($/kg)	$ 8.00	$ 8.00	$ 8.00
Sinews ($/kg)	$ 8.00	$ 4.50	$ 4.50
Blood ($/L)	$ 3.00	$ 3.00	$ 3.00
Heart ($/kg)	$ 3.00	$ 3.00	$ 3.00
Liver ($/kg)		$ 2.00	
Kidney ($/kg)		$ 7.00	

Table 18. Estimated average production of co products and value +++ (Chapman 2001)

Products	Fallow (carcase weight = 24 kgs)				Red (carcase weight = 55 kgs)				Rusa (carcase weight = 35kgs)			
	Ave volume	Fresh Value ($/kg)	Process Costs ($/kg)	Total $	Ave volume	Fresh Value ($/kg)	Process Costs ($/kg)	Total $	Ave volume	Fresh Value ($/kg)	Process Costs ($/kg)	Total $
Tail (ea) ###		$ -	$ 2.15	$0.00	0.75	$10.00	$ 2.15	$5.35	1	$ 1.00	$ 2.15	-$1.15
Pizzle (gms)	150	$ 8.00	$ 2.15	$0.88	300	$ 8.00	$ 2.15	$1.76	175	$ 8.00	$ 2.15	$1.02
Sinews (gms)	160	$ 4.50	$ 2.15	$0.38	300	$ 8.00	$ 2.15	$1.76	250	$ 4.50	$ 2.15	$0.59
Blood (gms)	1500	$ 3.00	$ 2.15	$1.28	3000	$ 3.00	$ 2.15	$2.55		$ 3.00	$ 2.15	$0.00
Heart (gms)	250	$ 3.00	$ 2.15	$0.21	500	$ 3.00	$ 2.15	$0.43		$ 3.00	$ 2.15	$0.00
Liver (gms)***	200	$ 2.10	$ 2.15	$0.01			$ 2.15	$0.00			$ 2.15	$0.00
Total				**$2.73**				**$11.84**				**$0.46**
Average value ($/kg hot carcase weight)				$0.11				$0.22				$0.01

******* **Average fallow liver weight = 1.0 kgs but only 20% are currently saleable**
**Assumes that only 75% of tails are marketable**
+++ **Values assume that markets are developed and products can be profitably collected, processed and marketed.**
xxx **Processing costs described are for collection, storage and packaging and for described on a per unit basis for tails**

Data in table 18 suggests opportunities to improve grower returns by $0.11, $0.22 and $0.01 per kg hot carcase weight for fallow, red and rusa deer respectively. **However the values assume that markets are developed and products collected and processed can be sold. Although potential markets for product have been identified and accessed, not all available products are in demand by current markets.**

Initial returns paid to growers are likely to be less than indicated in the table as significant investment in market development and marketing programs is yet to be made and producers must be able to give confidence to potential processors and marketers that consistent supply of quality assured raw products exists.

These data suggest likely improvement in grower returns should all product be sold in current markets. Opportunities to increase this direct grower return should: (i) increases in demand occur; (ii) average quality improve and; (iii) product collection techniques improve, are obvious. Other opportunities also exist as specific markets are developed, or expanded, for previously unsold or difficult to sell product like the rusa deer tails.

Early market research by Bilby International suggest a long term interest for rusa tails although current market development price achieved for small volumes of tails is only $1.00 each.

During the period of this project, February 2000, Bilby International began paying small premiums directly to farmers for co products obtained from deer they have purchased as evidenced by purchase receipts.

Potential tourist demand for processed co products

The number of tourists expected to visit Australia from China, Taiwan, South Korea, Hong Kong and Singapore is forecast to be almost 1.0 million people during 2001 and to rise to almost 2.8 million people by 2010. If the deer industry is able to influence only 20% of these people (about 190,000 in 2001 and 550,000 in 2010) to purchase deer velvet and co products and each buys approximately the same volume and value of products as purchased by similar tourists in NZ, returns to industry could be significant.

Tables 19A and 19B show estimated potential demand for specified venison co products assuming only 20% of the Asian tourists nominated purchase products.

Table 19A. Estimated potential demand for venison co products in 2001

Country		China	Korea	Hong Kong	Taiwan	Singapore	**Total**
Number Inbound tourists (2001)		163,000	187,000	161,000	150,000	299,000	**960,000**
Product	Average consumption	Estimated potential consumption by 20% of tourists (2001)					
Tails	0.136	4,435	5,088	4,381	4,082	8,136	26,122
Pizzles (kgs)	0.020	665	763	657	612	1,220	3,918
Sinews (kgs)	0.048	1,552	1,781	1,533	1,429	2,848	9,143
Blood (kgs)	0.012	388	445	383	357	712	2,286

Table 19B. Estimated potential demand for venison co products in 2010

Country		China	Korea	Hong Kong	Taiwan	Singapore	**Total**
Number Inbound tourists (2010)		1,100,000	689,000	278,000	235,000	480,000	**2,782,000**
Product	Average consumption	Estimated potential consumption by 20% of tourists (2010)					
Tails	0.136	29,932	18,748	7,565	6,395	13,061	75,701
Pizzles (kgs)	0.020	4,490	2,812	1,135	959	1,959	11,355
Sinews (kgs)	0.048	10,476	6,562	2,648	2,238	4,571	26,495
Blood (kgs)	0.012	2,619	1,640	662	560	1,143	6,624

The data do not include tourists from other Asian countries and in particular Japan although demand by Japanese tourists is thought to be less than from other Asian countries.

If the industry is able to encourage 20% of Asian tourists from countries nominated above to purchase the average per person volume of venison co products that are (estimated to be) purchased by similar tourists visiting New Zealand, returns to industry could be significant.

Table 20 shows the potential value of these sales (net of raw product and processing costs), but data does not include any estimation of marketing costs that are likely to be significant.

Table 20. Estimated retail value of potential venison co products sales +++

Product	Average per unit retail value	Total Value 2001	Total Value 2010
Tails	$1,316	$ 34,387,673	$ 99,652,611
Pizzle	$1,449	$ 5,676,842	$ 16,451,016
Sinews	$1,762	$ 16,109,643	$ 46,684,403
Blood	$ 910	$ 2,079,918	$ 6,027,429
Total		**$ 58,254,076**	**$ 168,815,458**

+++ Values assume that markets are developed and products can be profitably collected, processed and marketed.

Although data in table 20 appears very positive, the summary retail values assume: (i) all product collect from each animal processed are of sufficiently high quality to be processed and marketed and (ii) retail values give no insight to marketing investment requirements or risks of investment in new market development.

Current Australian Markets

Our investigation of Australian tourist markets, in particular health food shops and Asian herbalist shops, suggests that this market sector's knowledge of the Australian deer industry generally and the availability of deer co-products specifically, is almost nonexistent.

There are some commercial outlets serviced by Australian companies that have limited knowledge of the Australian industry. However there has been little or no commercial development of these markets and the only promotional material available to retailers is that produced by New Zealand.

Australian products were generally found in small health food shops or Chinese herbalist shops with no accompanying promotional material.

Other information gleaned from visits to retailers and potential retailers of deer co-products are confusing and appear to relate to either the retailer's clientele or, limited, previous experiences or both. For example some retailers suggested that deer antler powder was difficult to sell while others had the opposite view, some suggested that Asian buyers did not trust the content of encapsulated products while others held an opposing view.

Australian companies that are currently involved in the marketing of Australian deer products through either retail outlets or via the Internet include:

- Superior Young Life
- Wong Hoi
- Win Duc
- Tong Ren Tang
- Terramirra Deer Park
- Bulli – Velvet Deer Antler Cartilage Products

Market research by this project suggests that areas where initial market development is most likely to be successful are those of Brisbane, Surfers Paradise, Sydney and Melbourne. Within each of

these broad areas exist some businesses that have some knowledge of deer industry products and more importantly attract tourists likely to be attracted to the products.

6. Implications

The Opportunity

The apparent market opportunities for value added velvet and venison co products are obvious from the information contained in this report.

Estimates of the likely demand from the inbound Asian tourist market for these products can be reasonably estimated from estimates of similar product consumption and prices paid by Asian tourists to New Zealand.

Approximately four times more tourists from China, Korea, Hong Kong, Taiwan and Singapore visit Australia than visit New Zealand annually (about 220,500 and 960,000 people form these countries visited New Zealand in 2000 and is estimated to visit Australia in 2001 respectively).

New Zealand estimates suggest approximately 10% of all venison co products produced in New Zealand are sold to tourists. If 75% of are sold to tourists from China, Korea, Hong Kong, Taiwan and Singapore, estimated volumes of venison co products sold to these tourists (see tables 13 and 14) approximately equates to the volume of co products available from 30, 000 red deer.

The number of deer (all species) processed annually in Australia in recent years has gradually increased. However a reasonable guide to average annual production, for the purpose of estimating co-product production, is 40,000 animals.

Although the estimated retail value of New Zealand sales and estimated potential value of Australian sales to specified tourist markets is significant, many farmers will look at the retail values for value added velvet and venison co products and mistakenly expect an extra purchase premium form purchasers. However the values assume that: (i) markets are developed and products collected can be sold and (ii) all co products collected from each animal processed are of sufficiently high quality to be processed for the market.

Infra structures associated with production and marketing of deer co-products in New Zealand suggests that the most commercially effective method of marketing products to clients is via specialised retailers rather than through existing health food and herbalists businesses.

The Risks

Farmers must accept that investment in market development and marketing programs is significant and carries high risk (little has been undertaken to date) and those who take the risk expect to be reasonably rewarded for their risk should the investment be successful. Although retail market prices for value added velvet antler and venison co products suggest significant profit, investment in market development and initial accumulation of product is also significant and sales are not guaranteed. However as market demand for product increases and confidence in product quality and sustainable supply grows over time, farmers should expect increased premiums for their stock.

To successfully develop apparent market opportunities the Australian Deer Industry must work cooperatively to ensure the regular supply of marketable volumes, high quality product. The cooperative development of these apparent markets can lead to a direct increase (co product premium) in processors payments for livestock from the collection and sale of co products.

If the industry segregates and too many individuals or groups compete in their attempt to influence and service the apparent market, each small group is unlikely to be able to source, process and supply quantities of product that will sustain consumer interest. The lack of interest in sourcing product from a myriad of small suppliers will inevitably lead to fall in demand for Australian products and any co product premiums paid by processors of deer are likely to disappear.

Subsequently retail tourist business that have been introduced to these products will look for suppliers that can consistently provide commercial volumes of quality products and that is likely to mean New Zealand businesses.

Individual New Zealand businesses are already considering opportunities to development Australian inbound tourist markets for value added velvet and venison co products.

It is important for the Australian industry to begin development of these markets immediately and probably in cooperation with New Zealand business in an attempt to create supply channels that can meet the potential demand for products and minimise unnecessary trans-Tasman competition.

Cost of developing the markets, particularly marketing and promotional costs, and the establishment of specialised retail outlets are likely to be significant especially as little of no appropriate Australian promotional information currently exists and no specialised retail outlets exist.

Quality Assurance

To survive and expand, the industry needs to grow by demonstrating profitable, sustainable producer returns and subsequently attracting new producers or encouraging existing producers to expand.

Development of, and entry into, 'new' niche high value markets can provide an improvement in return to producers and the growth of the new markets can be controlled to match a gradual increase in the industry production base. Niche domestic and international market development for deer co products and value added velvet antler products will give further confidence to a small but expanding number of producers whose product meets strict quality standards.

The Australian Deer Industry's Quality Assurance program is well placed to aid the confident production of products that meet processor/marketer quality standards. I industry quality marks used by all sectors of the industry from production to marketing should be used to develop client perceptions of quality assurance for products produced by the Australian deer industry that carry the appropriate quality mark.

As part of the development of markets for velvet and venison co products, farmers, transporters and processors should be encouraged to adopt of the Industry's quality Assurance program and seek accreditation of their business by it.

Through its Committee for Proprietary Medicinal Products (CPMP), the European Agency for the Evaluation of Medicinal Products – Human Evaluations Unit is encouraging the concept of `Well Monitored Herds' to minimise risks of transmitting Animal Spongiform Encephalopathy (TSE) agents via medicinal products [European Agency for the Evaluation of Medicinal Products 2000]. They say that although the principal of well-monitored herds is attractive, implementation and policing need more consideration.

CPMP criteria for well monitored herds includes:

- Having no cases of TSE
- Having never been fed mammalian protein
- Having a full documented breeding history
- Having only introduced new genetic material from herds with a TSE free status
- Having all animals readily identified

The attitude of the CPMP reflects the wider community concern about potential risks to human health from products that are used by humans as food, medicinal and other products. The implications for those involved in the production of products like those obtained from velvet antler and venison co-products are likely to be significant. However well monitored quality assurance accreditation that provides consumers with safeguards required for food safety, animal welfare and animal husbandry issues would help guarantee market access for product. If fact, increasingly, quality assurance accreditation is becoming a minimum standard for market access rather than an extra standard for elite producers.

7. Recommendations

The apparent market opportunities for value added velvet antler and venison co products are clear for the body of this report. The demand for such products produced in Australia's deer industry, the transient Asian tourist population is likely to be able to consume all of the industry's production without consideration of the small but growing demand from Western Societies.

Inconsideration of the spending on pet foods by people in Europe, North America and Australia and pet owners willingness to ensure that animals are properly cared for, the market opportunities apparently offered by this sector appear significant.

However, to successfully develop apparent market opportunities the Australian Deer Industry must work cooperatively to ensure the regular supply of marketable volumes, high quality product.

The market is potentially too large and the Australian deer industry too small for more than one or two players. If more than one or two players enter the market all player will not be able to confidently source reliable quantities of consistent quality product and continually offer commercially acceptable quantities of product for sale.

Any lack of ability to supply clients in developing markets with their product requirements will encourage clients to seek supplies from businesses that can guarantee stability of supply and consistent quality (perhaps New Zealand suppliers).

The investment required to develop markets will be significant so a major recommendation of this report is that all sectors of the Australian deer industry, growers and processors alike, should cooperatively support no more than one or two businesses involved in the development of markets for value added velvet and venison co products.

It is important for the Australian deer industry to begin cooperative development of markets for value added velvet and venison co products immediately and probably in cooperation with New Zealand businesses in an attempt to create supply channels that can meet the potential demand for products and minimise unnecessary trans-Tasman competition.

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