

# Velvet Research Strategy



Velvet Antler Research  
New Zealand

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# 1. Ownership, version control and duration

This document has been prepared and adopted by the Board of Velvet Antler Research New Zealand Ltd ('VARNZ'). It is intended to apply until 2021 shortly after Deer Industry New Zealand ('DINZ') will have reviewed its overarching industry strategy and velvet industry strategy. In the meantime, this strategy will be reviewed annually by the Board.

		First application date
Current version	1.0	21 December 2016
Previous versions	n/a	n/a

## 2. Purpose

The purpose of this document is to-

- guide the VARNZ Board on research investment decisions; and
- inform velvet industry stakeholders on the type of research into which VARNZ is likely to invest in the short to medium term.

## 3. Background

This research strategy has been devised having regard to the supporting information in the Appendix, viz. -

- VARNZ's purposes;
- a situation analysis;
- the DINZ strategy;
- key velvet promotional activities (velvet) supporting DINZ industry strategy; and
- the Government's primary sector research funding priorities.

## 4. Scope

### 4.1 In scope

- Subject matter of velvet and deer co-product<sup>1</sup> research
- Co-commissioning of velvet research
- Research capability

### 4.2 Out-of-scope

- Protection of intellectual property
- Budget assumptions
- Procurement of funding
- Research programme consultation processes

<sup>1</sup> In this strategy, except where contextually inapplicable, in accordance with the inclusion of deer co-product research in VARNZ's Deed of Participation, the term 'velvet' includes 'deer co-products'. VARNZ treats the term "deer co-products" as a reference to "Chinese edibles", namely those by-products of slaughter for venison that are typically consumed only in China, viz. pizzles, tail glands and sinews.

## 5. VARNZ Research Strategy

### 5.1 Strategic and tactical balance

Since the New Zealand velvet industry comprises entities with different commercial goals, it is appropriate for a body receiving levies from all of them to commission research that is capable of application by multiple entities i.e. of generic benefit. This type of research is capable of supporting whole-of-industry strategies by its capacity to increase market appreciation of velvet's properties (rather than the properties of any particular velvet-containing product) or support a change in way the New Zealand velvet industry operates. Industry strategic research tends to be high risk but potentially high reward by virtue of the multiple ways in which it can be applied by industry participants or for its potential to discover a transformational marketing attribute. This type of research typically involves investigation into multiple biological pathways and/or experimental models (*in vitro*, different animal species, human trials), takes a long time (at least two years) and is not predominantly outcome-focussed.

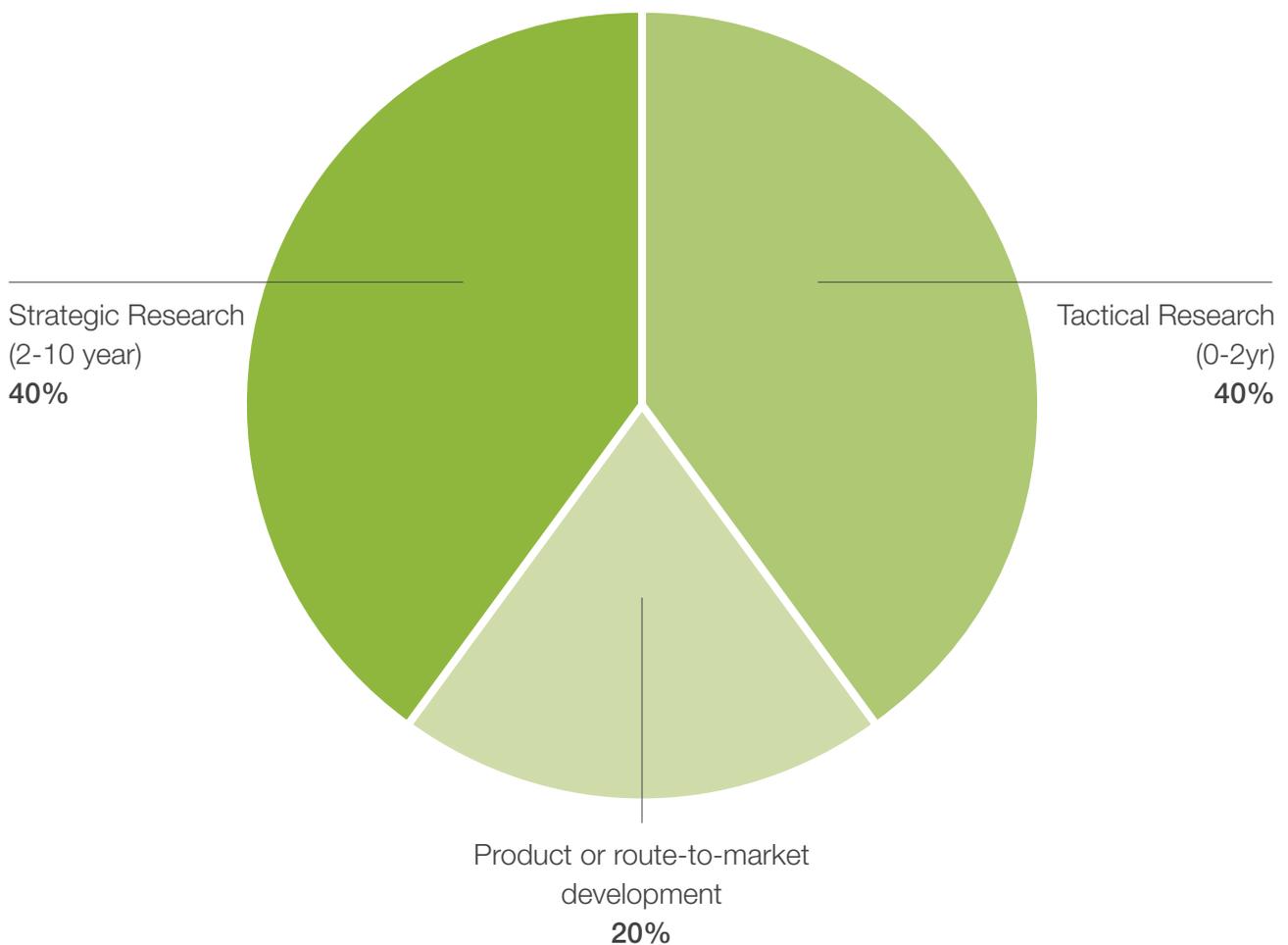
Sometimes the industry may benefit from taking advantage of a time-bound opportunity or responding quickly to a threat, in which case research focussed on narrow objectives with outputs of limited application or applicable to only a subset of participants is justified. This 'tactical' type of research must be focussed on outcomes being achievable from its knowledge outputs. It can often be undertaken in less than two years.

Occasionally, where there is insufficient commercial confidence for a commercial entity to act independently, yet significant benefit for the sector to act, it is in the industry's interests to develop a commercial product (whose marketing can stimulate significant demand for New Zealand velvet), develop a new processing technique, or pioneer a new route to market using a particular commercial product. In these instances, the outputs should be made available to industry participants to the fullest possible extent.

To balance these different interests, investment into research should be approximately split 40-40-20 (in budget terms) between:

- strategic research spanning over a longer period of time with less expectation on prompt commercial application;
- tactical projects that have a narrow and typically short-term focus; and,
- Product or route-to-market development, as shown in Figure 1 next page.

**Figure 1 - Balance of Research**



## 5.2 Potential to create industry impacts

Research projects must have significant potential to create long-term velvet industry impacts of the following kinds:

- improved profitability (through increased product quality, processing efficiency and/or quantity or perception of quality or integrity);
- maintenance or generation of market access; or
- maintenance of the velvet industry's freedom to operate.

## 5.3 Alignment of velvet research strategy with DINZ strategy

Table 1 shows the relationship between the impacts sought by investment under this research strategy, the objective of investment and the DINZ Strategy. It also provides examples of the types of subject-matter suitable for VARNZ investment. The funding proportions for each type of research (by industry impact) and the rationale for those proportions is provided thereafter. The rationale draws heavily upon the market outlook described in section 1 of the Appendix.

**Table 1**

Velvet industry impact	DINZ <b>strategic objective</b> and subsidiary goal	Objective of VARNZ investment	Exemplar type of research project
<b>Improved profitability</b>	<p><b>Premium positioning for our products:</b></p> <p>Maintain systems that provide robust assurance of the integrity and quality of NZ deer products</p> <p><i>(for research to support a consumer preference NZ velvet on the basis of the superior animal welfare of NZ deer, see bottom row</i></p>	<p>Generation of knowledge contributing to the velvet industry's assessment of <b>product integrity from a food safety perspective</b></p>	<p>Identification of the type, amount, toxicology, source and mitigation for contaminants of velvet whether arising from the production system (e.g. anthelmintic drenching) or velvet harvesting</p>
		<p>Improvement of current (e.g. NAIT, eASD) or development of new quality assurance systems that set standards dealing with <b>velvet quality, integrity and/or traceability</b></p>	<ul style="list-style-type: none"> <li>• Exploration of the geophysical, genomic or biochemical techniques to identify the origin of velvet whether in relation to New Zealand, the farm on which it was harvested, the species or sub-species of deer or the velvetting stag in question</li> <li>• Development of improved storage or transport conditions</li> <li>• Development of a velvet quality standard</li> </ul>
<b>Maintenance or generation of market access</b>	<p><b>Market Development and Diversification:</b></p> <p>Develop demand for deer products outside of their traditional supply channels to mitigate market concentration risk</p>	<p><b>Improve processing efficiency</b></p>	<p>Development of a processing or extraction technique that is cheaper or faster than existing techniques and whose product is of at least the same quality</p>
		<p><b>Product and market diversification:</b> generation of knowledge about the properties of velvet that support its consumption in non-traditional forms and/or new geographical markets of significant potential</p>	<ul style="list-style-type: none"> <li>• Velvet's therapeutic or nutritional functionality, when incorporated into non-traditional product types e.g. pharmaceuticals, foods or beverages, including work to support in-market regulatory requirements, particularly velvet's potential function to support gut health, metabolic health, immune health or to support weaning</li> <li>• Velvet's therapeutic or nutritional functionality in areas of particular interest to an emerging geographical market of potential significance</li> <li>• Overcoming market access barriers e.g. regulatory taxonomic classifications Specific product development (RepairRx only)</li> </ul>
		<p><b>Validating traditional functions:</b> generation of knowledge on velvet's generic benefits by researching its intrinsic attributes related to functions of traditional interest to customers and consumers</p>	<ul style="list-style-type: none"> <li>• Velvet's therapeutic or nutritional functionality (including development of bioactivity assays) of ongoing interest to stakeholders of a particular type e.g. traditional oriental medicine doctors, food manufacturers, whether undertaken <i>in vitro</i> or <i>in vivo</i> (animal or human models)</li> </ul>
	<p><b>Market Development and Diversification:</b></p> <p>Encourage building of relationships with in-market partners who respect our products and add value</p>	<p><b>Commercial product development</b> with entities whose demand for velvet is likely to be significant to the industry</p>	<p>Velvet function (including bioactivity assays) or processing improvements on specific functional properties or processing techniques of interest to entities willing to significantly commercialise products containing NZ velvet.</p>
<b>Maintenance of velvet industry's freedom to operate</b>	<p><b>Sustainable on-farm value creation:</b></p> <p>Ensure deer farmers can succeed while operating within their communities' environmentally and ethical expectations</p>	<p>Generation of knowledge to maintain the <b>freedom to operate</b> of the NZ velvet industry by identifying improvements that can be made to codes of welfare and regulatory/industry standards applicable to velvet harvesting</p>	<p>Animal welfare-related, including on pain avoidance, pain relief, maintenance of the 'five freedoms' of animal welfare, whether in relation to velvet production systems, the harvest of velvet or the transport of velvetting stags</p>

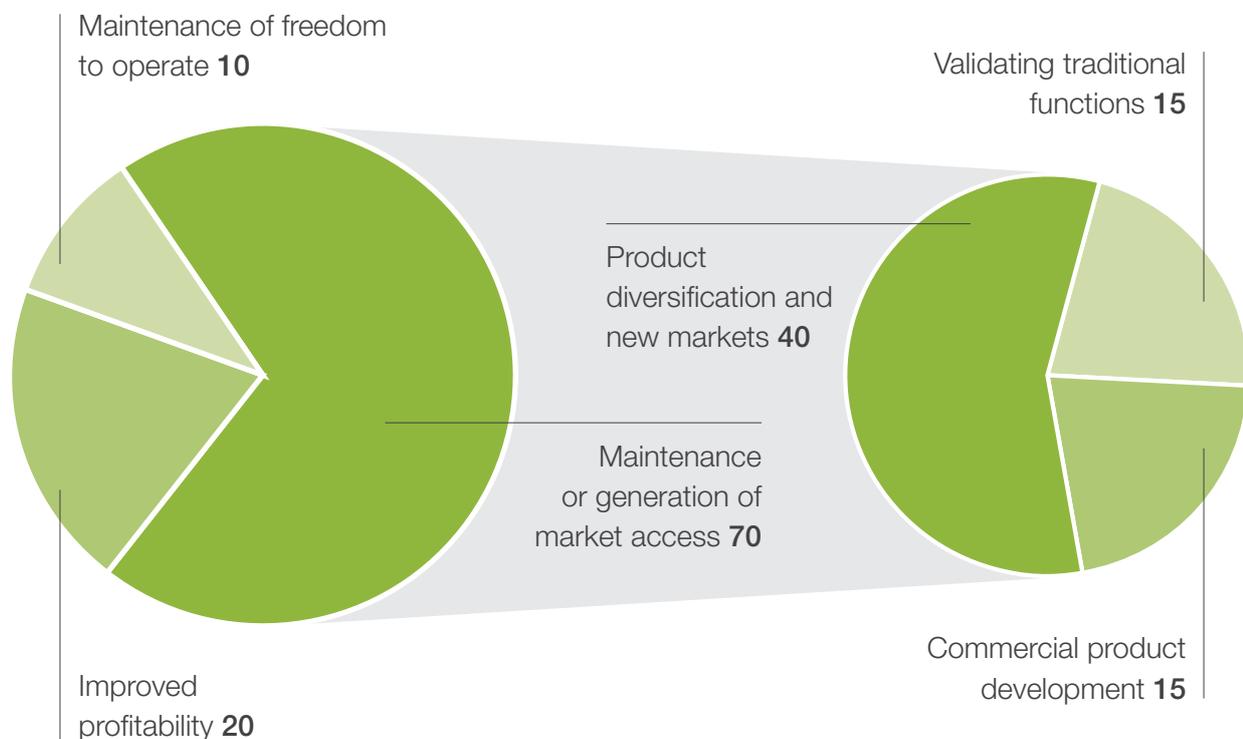
## 5.4 Funding proportions

Funding proportions are estimated over the 4 years' life of this strategy, rather than annually. The overall funding split between the industry impacts is depicted in Table 2 and Figure 2. Note that the Market Access industry impact is split into component parts. Rationale for these funding splits is also provided in this section.

**Table 2**

Velvet industry impact	Research objective	Funding split (%)
Improved profitability		20
Maintenance or generation of market access	<i>Product and market diversification</i>	40
	<i>Validating traditional functions</i>	15
	<i>Commercial product development</i>	15
	<b>Sub-total</b>	<b>70</b>
Maintenance of freedom to operate		10
	<b>Total</b>	<b>100</b>

**Figure 2 - Research funding by industry impact**



## 5.4.1 Improved profitability

Research investment into improved profitability through premium positioning is an emerging field of importance for New Zealand animal product sectors, particularly in the food space in which the velvet industry seeks to position itself. The velvet industry needs to understand the risks in its products and address them where possible, both of which VARNZ can assist with e.g. by commissioning residue studies to identify potential contaminants arising from deer production (health and feeding) inputs and velvet harvesting systems, investigating the risks posed by such contaminants and identifying practices that can mitigate or eliminate the risks.

Where product premiums are available based on velvet originating from New Zealand, VARNZ can support the velvet industry by commissioning research into techniques that can provide traceability to New Zealand or combat supply chain fraud.

Acknowledging that considerable work has been done on residues (particularly of velveting analgesics) and a reasonable amount on traceability (isotopic signatures), the growing importance of this strategic objective to the velvet industry and the opportunity for research to contribute towards its attainment warrants reasonable investment (20% of available funding) by VARNZ.

## 5.4.2 Maintenance or generation of market access

VARNZ has significant opportunity to contribute towards attainment of the DINZ strategic objective of developing and diversifying its markets by commissioning research that generates information on the benefits of velvet. VARNZ can provide its outputs to velvet marketers to encourage product development and support product marketing, thereby increasing demand for velvet production. For this reason, the bulk of investment (70% total available funding) should be directed to this type of research.

### **Product and market diversification**

40% of available funding should be invested into research into new types of velvet products (product diversification) or to support the uptake of velvet into new markets. Projects of this nature could encompass research into velvet extract types best suited for incorporation into a food/healthy functional food, beverage/healthy beverage, nutritional supplement or over-the-counter natural remedy; research into the functional properties of velvet of greatest potential interest, identification of biomarkers for the function of interest; research to overcome regulatory barriers that may be faced in those markets e.g. human safety research or taxonomic investigations supporting the sought-after classification of velvet.

### **Validating traditional functions**

Research into velvet's traditional function, that is, research to validate velvet's benefits as traditionally understood, irrespective of its place of origin or particular commercial product into which it may be incorporated, will be supported since it encourages marketers to continue supplying and promoting velvet. This type of validating research should receive 20% of available funding. It is not proposed to be higher as relevance of the outputs to any particular marketer- and therefore capacity to generate substantial impacts – will not be significant.

## Commercial product development

Research collaboration with partners is likely to achieve significant and tangible benefits to the velvet industry since such partners – most likely to be commercial entities but who could also be research entities or industry associations – have an interest in achieving impacts from their investment. Even though the project outputs will likely have a narrow focus, they are likely to be fairly low risk (especially where the partner is a commercial entity) and have wider impact through trailblazing new marketing opportunities for New Zealand velvet.

The short value chain entailed in such collaborations would facilitate the building of the strong and trustworthy relationships required to underpin sustainable growth in high value velvet exports and as such, may appear to warrant more than 15% of available funding. However, it is intended that each collaborator would match industry funding.

### 5.4.3 Freedom to operate

With regard to the DINZ subsidiary goal of ensuring that deer farmers can succeed while operating within their communities' environmental and ethical expectations much work on animal welfare, particularly in relation to velvetting techniques and pain relief has already been done. In the context of NZ societal expectation and thereby regulatory animal welfare framework, there is no major research gap – whether current or looming – that VARNZ can usefully fill to support the velvet industry.

Since consumers in emerging velvet markets are in the same region as current velvet markets (China and Korea) across which consumer animal welfare consumer expectations are broadly consistent, there is no new major market access constraint relevant to the welfare of velvetting stags.

Animal welfare research can therefore be treated as an issue that will require low-level 'maintenance' funding and will likely be focussed on research to front-foot domestic regulatory requirements rather than consumer expectations, and such projects may be of a tactical nature. The NVSB will be the principal proposer of research of this type. Investment will require demonstration of its outputs achieving impacts for the velvet industry.

The proposed funding for freedom to operate research is 10% of total available funding.



## 6. Investment Policies

The following policies are intended to be followed by VARNZ and research providers in contracting proposed research that meets the research strategy.

### 6.1 Project design

In general, research projects should be designed to achieve one or more of the specified industry impacts even if this would entail further work later. Project proposals should identify the category of velvet industry participants eventually capable of achieving outcomes from the project's outputs.

Research on the effects (including immunological, biochemical, genetic or physiological) of velvet should typically be proven in the identified target species (generally humans but super-premium petfood or veterinary therapeutics could present as marketing opportunities) and should usually precede work on causation. The rationale is that generating signals of effect in the target species will identify meritorious functions worthy of further exploration, whereas building a 'bottom-up' academic case for functionality commencing with a significant amount of *in vitro* work and *in vivo* work in non-target species could entail significant amounts of wasted research in non-target models where the function in question is not replicated in the model of interest. Similarly, *in vitro* studies will not always translate to effects in the target species of interest. By contrast, bare signals of effect in the target species, even those of a non-physiologic type and whose nexus to a physiological effect are unknown, can support velvet promotion to consumers and engender third party interest in commercial product development and collaborative research.

When contemplating *in vivo* functionality research, VARNZ will carefully balance the costs and benefits of undertaking regulated yet informative human trials with attendant reporting implications against typically cheaper and simpler *in vitro* investigations or *in vivo* animal studies whose results may later prove to be 'falsely positive' of the result in the model of interest.

### 6.2 Considerations where funding is limited

Where project prioritisation is difficult, that is, several opportunities meeting the research strategy are competing for the same funding allocation, VARNZ will take into account the following factors:

#### 6.2.1 Capability

Projects will be preferred that give rise to opportunities to sustain the long-term provision of velvet research capability in New Zealand having regard to the capability signals VARNZ's principal research providers are typically responsive to and their own capability policies.

#### 6.2.2 Alignment with funding opportunities

Without prejudice to the research strategy<sup>2</sup>, and the overriding need for research to be industry good in nature, projects will be preferred that attract third party co-funding, whether directly from the Crown, Crown-funded agencies or other entities, in order to maximise the funding sourced from velvet levy-payers.

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<sup>2</sup> The research strategy has been written with co-funding opportunities in mind; if the direction of major co-funding opportunities changes, this would trigger a review of this research strategy.

# Appendix: Supporting information

## 1. VARNZ purposes

VARNZ's purposes are specified in clause 3.2 of the Deed of Participation between the shareholders. Insofar as they are relevant to this science strategy, they are as follows:

- to commission and fund AgResearch or any third party to undertake research and development in respect of deer velvet antler and deer co-products according to strategies and priorities deemed appropriate by the Parties and as funded from time to time by [the shareholders] and/or third parties and aimed ultimately at being of benefit to the deer industry;
- to identify core competencies and capabilities of the Parties, and those of other scientific research providers and, where appropriate, commission them to undertake research and development”.

## 2. Situation analysis

### 2.1 Shareholder perspectives

The shareholders support VARNZ seeking to commercialise RepaiRx without undertaking further research. Their appetite to invest in other specific product development projects without committed co-funding by potential commercial partners is small.

On intellectual property, while the shareholders support VARNZ maintaining its RepaiRx patents with a view to achieving a return on science investment, they prefer that VARNZ's functionality-related research projects generate knowledge available for unhindered uptake by all velvet industry participants.

### 2.2 Velvet production and processing

Stable to firming prices for New Zealand velvet for the last six years have underpinned a growth in producer confidence in the velvet industry, such that velvet supply to market is secure. More and more product ultimately destined for use in Korea is being shipped from New Zealand to China, where it is processed. More processing of New Zealand product could take place in New Zealand in the next few years owing to the gradual reduction in Korean tariffs on imported processed velvet.

## 2.3 Velvet markets

### 2.3.1 Existing markets

The velvet industry continues to increase the volume of product sold for incorporation into healthy foods in Korea, a regulated channel dependent on proof of the food's capacity to have the claimed biological effect. The scope for channel diversification is increasing in Korea, since its health-conscious consumers embrace novel healthy food and drink formats that include traditional oriental medicine ingredients.

The nutraceutical marketers have formidable in-house research, development and marketing departments making them potential collaborators with VARNZ on applied research. They value New Zealand's good biosecurity status and reliable and hygienic velvet production systems and as such are prepared to enter into secure supply arrangements for New Zealand velvet at premium prices.

Chinese velvet consumption continues to grow and its similarly regulated healthy functional food sector is potentially a premium sales opportunity for New Zealand velvet, albeit that the pathway to market requires clarification. Success in a current VARNZ project in this space could encourage product development by other manufacturers and thereby warrant more functional – and potentially collaborative – research being done into areas of health of most interest to Chinese consumers.

Regulatory acceptance in China of New Zealand velvet as a permissible health functional food ingredient is lacking, and this is a constraint to encouraging new product development channels for New Zealand velvet. However China's recent official recognition of NZ velvet as a bona fide TCM ingredient (rather than agricultural by-product) and requirement for NZ marketers and processors and Chinese importers and processors to be registered with the Chinese authorities improves velvet's status as a safe ingredient and should encourage its incorporation into high value non-traditional products. China places significant value on New Zealand's elite biosecurity status.

It may not be straightforward to introduce into traditional velvet markets velvet-containing health products that are not administered orally (such as RepairRx), since consumers in those markets associate velvet with oral consumption. Considerable marketing effort would be required to gain acceptance of velvet as an ingredient of products taken in other formats, such as topical lotions or gels.

### 2.3.2 New markets

A constraint to diversifying velvet's markets is that consumer awareness of velvet at all, or more specifically as a health-supporting product, is low outside the markets where it is traditionally consumed. Nevertheless, the capacity for unfamiliar markets to embrace the attributes of ingredients used in alternative therapeutic systems (such as traditional oriental medicine or complementary medicine) is growing. Western recognition of traditional oriental medicine has been achieved by a Nobel prize having been awarded for development of an anti-malarial drug from a traditional oriental medicine ingredient.

Once consumers in these markets are accepting of velvet as a functional ingredient, there should not be any particular barriers to the form of administration, given the lack of preconceptions in this regard. Indeed, honey-based wound dressings have not been constrained in this regard despite western consumers typically regarding honey as a food.

### 2.3.3 Brand positioning

The opportunity exists to use functionality research outputs to convince customers of the intrinsic value of velvet that justifies its development and use as a nutraceutical or health item to which premium product prices apply.

### 2.3.4 Brand integrity

On the whole, New Zealand is regarded by its trading partners as a reputable supplier of primary products free from pathogens and contaminants and whose systems are well geared to dealing effectively with product contaminations and endemic and exotic animal diseases. While its systems afford it market access rather than market premiums, there are opportunities to command premium prices in markets that attach value to product traceability and integrity back to the farm of origin, in particular where velvet is for use in a regulated market such as health or dietary supplements or pharmaceuticals. There is therefore a market opportunity to use research to develop robust velvet farm traceability systems.

New Zealand's reputation for upholding very high standards of animal welfare is largely stable. The major velvet markets are comfortable with the animal welfare aspects of velvetting (it being a long-standing practice on deer in those markets) and there has not been any recent attention in the venison markets on animal welfare aspects of velvetting. Nevertheless, unforeseen circumstances can occur that may warrant reactionary research to maintain the velvet industry's freedom to operate.



### 3. Deer Industry New Zealand Strategy Summary

The DINZ strategic objectives and subsidiary goals relevant to velvet research are shown in bold in Table 3, which contains a summary of the DINZ Strategy.

**Table 3**

A CONFIDENT AND GROWING DEER INDUSTRY				
Strategic Objectives	Premium positioning for our products	Market Development and Diversification	Sustainable on-farm value creation	Cohesive and Respected Industry
Subsidiary Goals	Maintain systems that provide robust assurance of the integrity and quality of New Zealand deer products	Develop demand for deer products outside of their traditional supply channels to mitigate market concentration risk	Create an environment in which deer farmers continuously improve their operations to deliver greater value more efficiently	Ensure sufficient communication between industry participants to allow effective sharing of ideas, information, support and confidence
	Communicate the quality and integrity and benefits of our deer products to customers and consumers	Encourage building of relationships with in-market partners who respect our products and add value	Ensure deer farmers can succeed while operating within their communities' environmentally and ethical expectations	Ensure that the deer industry continues to be considered an innovative and attractive but mainstream industry
2020 Targets	<b>Venison</b> <ul style="list-style-type: none"> <li>• Venison pricing relative to equivalent beef, lamb ++</li> <li>• Venison pricing relative to other game items ++</li> <li>• Consumer/customer recall/preference ++</li> </ul>	<ul style="list-style-type: none"> <li>• Proportion of venison sold chilled (&gt;20%)</li> <li>• Proportion of venison sold to Eurozone (&lt;50%)</li> <li>• Proportion of venison sold in N. America and Asia (&gt;40%)</li> </ul>	<ul style="list-style-type: none"> <li>• P2P programme participation (&gt;25%) of industry</li> <li>• Survival to sale (+5%)</li> <li>• Kill date (-16 days)</li> <li>• Carcass weight (+2kg)</li> <li>• (&gt;50%) industry has environmental plan</li> <li>• (&gt;50%) industry has Health&amp;safety plan</li> <li>• NVSB compliance (&gt;95%)</li> <li>• Animal welfare prosecutions involving deer (&lt;5PA)</li> </ul>	<ul style="list-style-type: none"> <li>• Industry event attendance ++</li> <li>• Media and website readership (+100%)</li> <li>• Deer farmer satisfaction survey (+50%)</li> <li>• Survey attitudes to industry of non-deer farmers (+50%)</li> <li>• Deer specific training attendance (+50%)</li> <li>• Deer industry media mentions (+50%)</li> </ul>
	<b>Velvet and co-products</b> <ul style="list-style-type: none"> <li>• NZ velvet pricing relative to competitors ++</li> <li>• Preference of OMD sector for NZ velvet ++</li> <li>• Preference of healthy food sector for NZ velvet ++</li> <li>• Co-products FOB price ++</li> </ul>	<ul style="list-style-type: none"> <li>• Proportion of velvet sold into healthy food applications (&gt;40%)</li> <li>• (&gt;30%) of velvet exported processed, not frozen</li> <li>• No country imports &gt;50% of New Zealand's velvet</li> </ul>		

While there is a DINZ subsidiary goal of communicating the benefits of our deer products to our consumers, this goal is focussed on the relative benefits of New Zealand deer products over deer products produced elsewhere. Given that there is no obvious functional differentiation for New Zealand velvet from other velvet, and velvet functionality research (done under the 'market development' strategic objective) should stimulate demand for all velvet, this DINZ goal is not treated as a driver for this research strategy.

## 4. Key velvet industry activities supporting DINZ industry strategy

Table 4

	Korea Market Development (healthy foods)	Korea Market Support (traditional sector)	China Market Development	Other Market Support and DINZ Services
<b>Premium Positioning of NZ Deer Products</b>	Improving the brand value through direct connection with well-respected Korean food companies.	Improving the NZ velvet position in OMD's minds through promotion and the country of origin programme.	Clarifying the regulatory pathway to enable promotion of the NZ velvet provenance.	Ensure marketing collateral (including website and generic brochures) is maintained to enhance the NZ velvet brand.
<b>Market Development and Diversification</b>	The healthy food strategy helps to augment the traditional Korean Oriental Medicine Doctor (OMD) channel.	Target the new generation of OMD supplier companies that add brand value, rather than just trading velvet.	Identify and work with key healthy food companies that can provide long term stability to NZ velvet.	Identify new geographic markets and channels to reduce an over reliance on a small customer group.
<b>Sustainable On-Farm Value Creation</b>	Respected Korean food companies and NZ velvet producers share a similar vision of price stability. Increasing the influence of this sector will provide sustainably acceptable returns.	Increasing willingness to pay through improving the NZ velvet brand will ensure best value to NZ producers.	Maximising the value through the optimum sales channel will encourage increased returns to producers.	Provide sustainable returns through identifying new geographic markets.
<b>Cohesive and Respected Industry</b>	Significant companies promoting NZ velvet offers pride and some "ownership" for NZ producers.			Ensuring long term stable returns at profitable levels through working together with an agreed market direction.

## 5. Research funding opportunities

While primary production is not supported by direct government subsidies to commercial participants such as farmers and processors, there are opportunities for sectors to improve profitability through accessing funding for research. The major funding sources with some application to VARNZ's purposes are listed in table 5.

In terms of public funding, the government invests in research where it is likely to produce returns of significant benefit to the New Zealand economy. The velvet industry can maximise the return from levy investment into R&D by prioritising its investments into areas that will benefit both it and the wider economy where government co-funding (typically Crown Research Institute core funding) is available. Benefits to the wider economy from velvet research could include development of science capability, scientific method development and better understanding of consumer needs and regulatory and logistical pathways in key markets for New Zealand products.

The Government's high level position on primary sector research investment, as set out in the National Statement of Science Investment<sup>3</sup> is as follows:

*Government expenditure is responsible for a significant proportion of R&D in the primary sector. We will seek to incentivise further industry investment, and reduce our high rate of co-funding over time, while focusing Government funding on high-quality discovery research.*

*Given the critical importance of the primary sector to the New Zealand economy, we do not propose to reduce government's total investment in this area and will seek to increase it over time. We will target future investment carefully to foster and incentivise more industry investment in R&D, and seek to avoid crowding it out. We will seek to decrease government's proportion of contribution to each project, but fund more or larger projects. Where government is directly funding research that is not co-funded by industry, we will seek to invest in more ideas-driven, discovery research into primary industries, and ensure long term critical industry-good research. Closer-to-market research that supports and extends existing business models should primarily be funded and led by industry, for example through levy mechanisms.*

This signals that future Crown research co-funding is likely to be concentrated at the fundamental end of the research spectrum (rather than in applied areas of research of most interest to velvet industry participants). Its reference to large projects tentatively signal that the velvet industry, being small by value compared with primary sector giants such as dairy, forestry and wine, is unlikely to access funding for bespoke velvet research projects, in which case government fully-funded velvet research opportunities could be confined to sub-projects within larger projects or programmes. Accordingly, VARNZ needs to be well connected to significant research programmes (such as key National Science Challenges) at programme design stages.

VARNZ would benefit from setting its research projects to align with the purposes for which core funding is made available to key Crown Research Institutes, especially AgResearch, and to align with the objectives of other research programmes from which co-funding may be available.

VARNZ's capacity to access a particular fund depends on its eligibility rules. In some cases, a project sponsor other than VARNZ may be necessary (e.g. DINZ or the New Zealand Deer Farmers' Association), but that sponsor and project may benefit from VARNZ's expertise in research governance in the industry-good arena.

<sup>3</sup> <http://www.mbie.govt.nz/info-services/science-innovation/pdf-library/NSSI%20Final%20Document%202015.pdf>, Released in October 2015

## Summary of major funding opportunities for primary sector research

Table 5

Funder	Name of Research programme or description of fund type	Funding focus	Alignment with VARNZ research strategy
<b>Agmardt</b>	Agribusiness Innovation Grants:	New Zealand based research providers undertaking new and innovative projects that will benefit the agribusiness sector.	Benefit to agribusiness sector aligns with VARNZ strategy in general
	<i>Pre-trial/pre-research, or demonstration/investigation purposes</i>	Seed funding grants of up to \$20K (inc. GST) are available to applicants, without co-funding, for preliminary investigation or demonstration purposes (total project costs must not exceed \$20K (inc GST).	
	<i>Research and technology development</i>	Grants of up to \$200K (inc. GST) are available for businesses, researchers and industry groups to develop and evaluate innovative ideas to a stage where they can attract other funding for further development through to commercialisation.	
<b>Brain Research NZ</b>	Biomarkers and Recovery in Stroke	MicroRNA, urea cycle	Good alignment with market development and diversification objective
	Alzheimer's Disease: biomarker discovery and drug testing	Identification of molecules that relate to stroke damage and potential for repair and predict recovery	
<b>Callaghan Innovation</b>	Expertise in ICT, manufacturing and design, biotechnology, measurement standards, sensing and automation and advanced materials. Its biotech expertise is concentrated on transforming biological resources such as meat, dairy, plant and seafood products into high value products that include nutraceuticals, cosmeceuticals, food ingredients and natural agrochemicals	Expertise in ICT, manufacturing and design, biotechnology, measurement standards, sensing and automation and advanced materials	Its biotech area aligns well with velvet quality, improving processing efficiency and commercial product development research objectives.
<b>Health Research Council</b>	n/a: 5 types of funding opportunities  Explorer Grant (up to \$150K available p.a.) provides seed support for transformative research ideas at an early stage; proposal must advance ideas considered to be transformative, innovative, exploratory or unconventional, and have potential for major impact. An impact on knowledge is valid, and the idea doesn't have to be immediately applicable in terms of a health outcome.  Grants for feasibility studies (human clinical research) are available but not for small stand-alone studies, pilot studies or the general development of a research area.	2 relevant investment signals: Health and Wellbeing in NZ and Improving Outcomes for Acute and Chronic Conditions in New Zealand.	Velvet healthy ageing research maps to either or both of the two referenced signals.

Funder	Name of Research programme or description of fund type	Funding focus	Alignment with VARNZ research strategy
MBIE	<p>Endeavour Fund:</p> <hr/> <p><i>Smart Ideas:</i> Generating Ideas: fast-fail support to catalyse and rapidly test promising, innovative research ideas with high potential for benefit to New Zealand, to enable refresh and diversity in the science portfolio. Contracts are awarded for two to three years (\$0.4-\$1m total contract value) (see more detail below).</p> <hr/> <p><i>Research programmes:</i> Developing Ideas Supports the development of ambitious, excellent, well-defined research ideas, which, collectively, have credible and high potential to positively transform New Zealand's economy, environment, and society. Contracts are awarded for three to five years (up to \$0.5m p.a. per contract)</p>	<p><i>High post-harvest value add</i> is what Endeavour wants to invest in in for the primary sector</p>	High post-harvest value research aligns well with velvet functional research
	<p><i>Pre-Seed Accelerator Fund</i> to support early stage technology commercialisation activities which:</p> <ul style="list-style-type: none"> <li>• maximise the commercial benefits to NZ from publicly funded research</li> <li>• improve the commercial capability and skills of public research organisations</li> <li>• promote linkages between public research organisations and potential private sector partners, including industry players and capital providers, in New Zealand and offshore.</li> </ul> <p>Co-funding available only (50:50 matching)</p>	No particular focus	Good fit for scoping/feasibility/proof-of-concept research under all velvet research objectives
	<p>Sustainable Farming Fund</p> <hr/> <p>Food safety science group-convened</p> <hr/> <p>Animal products-related</p>	<p>Tactical, farmer/grower-led initiatives to solve an industry problem; fundamental research and product commercialisation research excluded but applied research included</p> <hr/> <p>OMAR<sup>4</sup> setting related e.g. toxicology</p> <hr/> <p>OMAR compliance-related e.g. MRL surveillance</p>	<p>Alignment with research objectives under Improved Profitability and Freedom to Operate industry impacts</p> <hr/> <p>Aligns with product integrity from a food safety perspective under Improved Profitability industry impact</p>

<sup>4</sup> Overseas market access requirement

Funder	Name of Research programme or description of fund type	Funding focus	Alignment with VARNZ research strategy
National Science Challenges	High-Value Nutrition	Develop high-value foods with validated health benefits to drive economic growth. In particular, this NSC is focussing on gut, metabolic, immune health and the development of weaning foods for health.	Gut, metabolic, immune and weaning health aligns with the <i>Validating Traditional Functions</i> research objective as they are TOM indications for velvet
	Ageing Well	Neurodegeneration, stroke, gerontology, physical function, primary health care, economics, demography/epidemiology, geography and social science. Includes some high risk-high return work	Maps to Product and market diversification research objective
Royal Society of New Zealand	Charles Fleming Senior Scientist Award	Up to \$10,000 p.a. to support the research of a senior scientist at a university, Crown Research Institute, polytechnic or other research organisation in New Zealand, and that of their research group.  Examples include expenses to: <ul style="list-style-type: none"> <li>cover a visit to an institution in New Zealand or overseas;</li> <li>expenses related to specialist assays or methodologies;</li> <li>research assistance to carry out a specific task; or</li> <li>expenses relating to a visit to the research group of a visitor.</li> </ul>	Could apply to any of the velvet research objectives
	Marsden Fund: Contributes to development of researchers. Not tied to Government's socio-economic priorities.	Supports excellence in science, engineering, maths, social sciences and the humanities in New Zealand  <i>Biomedical sciences:</i> Research related to human health and disease in: physiology, pathology, pharmacology, molecular biology, genetics, cell biology, microbiology; neurobiology (including animals as a model species for humans); human genomics and related bioinformatics.  Cellular, Molecular and Physiological biology: studies related to understanding the activities that occur in cells and tissues, and their integration within living organisms across the biological, agricultural and veterinary and biochemical sciences. This includes: plant physiology; animal physiology; cell biology; plant and animal genetics; molecular biology and molecular genetics; functional genomics and related bioinformatics; microbiology excluding microbial ecology; animal and plant pathology.	Good fit with research under the Market development and diversification industry impact
	Rutherford Scholarships, Rutherford Discovery Fellowships	Scholarships: Supports early career researchers, funds PhD scholarships and postdoctoral fellowships, and helps bring outstanding overseas NZ researchers back home.  Discovery fellowships: Supporting New Zealand's most talented early- to mid-career researchers for a five year term.	PhD studies and long term research projects meet section 6.2.1 of research strategy (preference given to projects that can add to NZ velvet research capability)

 **Velvet Antler Research  
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Velvet Antler Research New Zealand is a joint venture  
between Deer Industry New Zealand and AgResearch

  
*āta mātai, mātai whetū*

 **Deer Industry  
New Zealand**