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**Can the dairy industry's tarnished cousin reinvent itself to help with our ticking time bomb? The opportunities and challenges with establishing a New Zealand Veal value chain.**

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Kellogg Rural Leadership Programme

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## 2 Executive Summary

The New Zealand dairy industry has a growing risk with social licence to operate due to increased pressure from both customers and the public on the practice of slaughtering between 1.8–2.5 million surplus calves at an early age, either as a bobby calf or euthanised on farm.

Internationally there is a significant veal market, with much of the production for this coming from surplus dairy calves. However, despite having the highest global numbers for bobby calves, New Zealand does not yet have a veal industry here to further utilise some of these.

The purpose of this report was to provide some context and further understand the issue with bobby calves and the risk to social licence to operate, and then understand what the opportunities, benefits, challenges, and implications might be at the various points of the value chain with establishing a veal industry in New Zealand as a partial solution to reducing the number of calves slaughtered early.

There were two components to this research. A review of existing literature including research, industry reports, articles and opinion pieces was used in order to evaluate the current international veal systems that exist and how these compare to the opportunity to establish a veal system in New Zealand, where the challenges may be, and what may need to be adapted to suit our country. In addition, semi-structured interviews were conducted with various value chain participants and industry voices including; dairy farmers, calf rearers, finishers, farm consultants, meat processors, dairy processors, research institutes and universities, retail and some international voices. The interviews were used to understand their views on current practices and the associated risks, and then the potential for a veal industry here in New Zealand, how it might fit our systems and what the opportunities and challenges would be.

A veal industry in New Zealand has the potential as a partial solution to help reduce the number of surplus dairy calves slaughtered at a young age. There are a range of benefits and opportunities including a reduction in bobby calves, reduced risk to social licence, improved on-farm mental welfare, improved sustainability outcomes, environmental benefits, and additional revenue for the country through exports of another red meat.

However this is a complex topic and includes a number of challenges and barriers that need to be addressed in order to establish a veal industry here including developing the integrated farm systems that suit our country and result in a product that is fit for the desired veal markets, finding sufficient land to incorporate these systems, market development and consumer education, processing capability and capacity, and reduced volatility in pricing to ensure sustainability of supply chain partners.

Further, the whole transition to fewer bobby calves needs to be carefully managed to ensure the current risk to the industry is not further heightened until solutions of scale are available.

The key to any success at scale will be good collaboration between industry sectors and partners. There are a number of steps that need to occur for a veal industry to be established here including significant research, modelling and development of farm systems and markets, as well as some trials to develop the supply chain systems. It appears there is movement starting to happen at both industry and commercial levels and it is likely we can expect to see some change in the near future. While there are significant challenges to overcome, I think we may see innovation within the industry and a veal supply chain in New Zealand in the future.

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### 3 Introduction

The New Zealand dairy industry currently has approximately 4.9 million milking cows (DairyNZ, 2019) that calve annually, and there are currently between 1.8 – 2.5 million calves that do not make it beyond four days, slaughtered as a bobby calf or euthanised on-farm (McDermott, personal communication, 2020).

Despite significant improvements to standards to improve the welfare of calves in recent years, there is growing concern both domestically and internationally around the practice of early slaughter of unwanted calves from the dairy industry, commonly known as bobby calves, and growing pressure to reduce or even eliminate early slaughter of these calves. This pressure from market and the public are a continued risk to the industry with social licence to operate.

Internationally there is a significant veal market, with much of the global production for this coming from surplus dairy calves. However, despite having the highest global numbers for bobby numbers, New Zealand does not yet have a veal industry here.

While there have been a number of reports completed around the issue associated with bobby calves in the dairy industry and some work on the potential solutions, there has been little published focussing on the potential for a veal industry in New Zealand.

### 4 Aims & objectives

The purpose of this report is to:

- provide some context on the issue that exists around surplus dairy calves
- look at what the associated risk is to social licence to operate for various industry players
- understand what the opportunities, benefits, challenges, and implications might be with establishing a veal industry at the various points of the value chain
- review what occurs internationally with veal supply chains and how these compare to what could be implemented in New Zealand, looking at where we are similar and what differences there may be
- understand what the thoughts are from various potential value chain participants and industry voices here in New Zealand including what they think we could or should look to implement here, the opportunities and challenges they see, the feasibility and any other thoughts they have.
- Provide some insights into the desirability and motivation from the various sectors for a veal industry to be established.

This report does not include an economic analysis of the veal supply chain.

### 5 Method

The methodology used for this report was a combination of a literature review, semi-structured interviews, and thematic analysis.

A review of existing literature including research, industry reports, articles and opinion pieces was used in order to evaluate the current international veal systems that exist and how these compare to the opportunity to establish a veal system in New Zealand, where the challenges may be, and what may need to be adapted to suit our country.

A total of 17 semi-structured interviews were conducted with a conscious effort made to include various value chain participants and industry voices including; dairy farmers, calf rearers, finishers, farm consultants, meat processors, dairy processors, research institutes and universities, retail and some international voices. Interviews were conducted largely via phone or Zoom, with some completed in person, and took approximately one hour each. Interviewees were given an overall

introduction to my topic, the scope of my report, and then asked a range of questions that broadly covered off the following areas. Some information was provided on veal when required for their understanding.

- Views on bobby calves and the risks to social licence to operate
- Thoughts on potential for a veal industry in New Zealand and their desirability to see this occur
- The type/s of veal systems New Zealand should consider
- Where it might fit within our farming systems
- Challenges and implications
- Opportunities and benefits
- Critical success factors
- Any other thoughts or opinions they had on a veal industry for New Zealand

A qualitative approach was used with thematic analysis (Braun, V. & Clarke, V. (2006) to help me critically analyse and draw conclusions on the opportunities and challenges for a veal industry in New Zealand. Throughout the report most comments and opinions from my interviews are anonymous. This was at the request of some interviewees and allows a more thorough review of the topic.

Following this, recommendations and next steps have been included based on the critical analysis of this research on existing veal systems internationally and the information and opinions gathered from interviewees.

For the purposes of this report the following terminology is used:

- ‘Bobby veal’ – this refers to veal calves that are slaughtered at approximately 4-7 days of age and for the purposes of this report will often be inclusive of those calves that are also euthanised on farm.
- ‘Veal’ – this refers to calves that are retained to an older age than bobby veal and includes animals up to the age of 12 months
- Euthanasia – while this usually refers to ending the life of a very sick animal which would otherwise suffer for an extended time. In this report it includes the slaughter of healthy animals that are surplus to requirements.

There are a number of limitations to this research including only a small portion of the industry were interviewed and no economic analysis has been completed for a veal industry in New Zealand.

## 6 Bobby calves

### 6.1 Current practices in the NZ dairy industry

The New Zealand dairy industry currently has approximately 4.9 million milking cows (DairyNZ, 2019). The greatest physiological stimulus for milk yield is pregnancy, and so in simple terms, in order to produce milk, a dairy cow must produce a calf (McDade, 2015).

Of the calves born in the dairy industry, approximately 1.1 million heifers are retained for replacements based on an average 22% replacement rate (Cvitanovich, 2016), a number are reared for the beef industry or live exports, 1.8 million are slaughtered as bobby calves (Statistics NZ, 2020), and an unknown number are euthanised on farm. In total, there is estimated to be 1.8-2.5 million calves that do not make it beyond four days, slaughtered as a bobby calf or euthanised on farm (McDermott, personal communication, 2020).

A bobby calf is defined as an un-weaned calf that is intended for processing within approximately the first week of life for human consumption or pet food (MPI, 2018). Currently the minimum age at which a calf can be transported to sale yards or an abattoir in New Zealand is four days (Dairy NZ, 2020). With feeding required for four days which requires labour and a number of inputs, and the low



economic return received for a bobby calf at slaughter, many farmers make the decision to euthanise these calves at birth instead of rearing for four days. Others make this decision based on their view that this is a more ethical option than waiting four days and then the calf enduring transport etc.

There are some farmers in New Zealand who already achieve zero bobby calves on-farm. While this is currently possible for individual farms, solutions are still required to be able to achieve this at an industry scale.

## 6.2 The problem the industry is facing

There is growing concern both domestically and internationally around the practice of early slaughter of unwanted calves from the dairy industry, commonly known as bobby calves. Changing social and cultural attitudes toward food and its attributes will drive further change in how food is produced and consumed (Dairy Tomorrow, 2017).

There are three main factors contributing to this concern: animal welfare, ethical views, and wastage.

Animal welfare concerns are related to the way in which the calf is reared, managed and handled on-farm, during transport, during lairage and at slaughter and any effects this may have on the health and welfare of the calf. This is of particular concern with bobby calves due to their very young age at which this occurs and thus increased vulnerability to welfare compromise (MPI, 2018).

Industry and MPI have put significant effort into improving the rules and regulations around practices required with bobby calves in recent years to improve the chain of care. One driver for these improvements came from a number of photos and videos in media of bad practices with calves. These changes have significantly improved the welfare outcomes, and in 2008 there were 0.68% of calves that died before reaching slaughter or condemned on arrival as not fit for human consumption, by 2017 this had dropped to 0.06% with improved welfare practices (Montgomerie, 2019).

With a large number of calves euthanised on-farm at birth, there are also significant concerns with the welfare of the calf and whether humane slaughter practices are routinely followed. Again, a number of video's have been released over the years by activists showing inhumane practices. In addition to this, the New Zealand Meat Industry Association (MIA) suggested in a 2014 report that the government could help by banning on-farm euthanasia of bobby calves, except in extreme circumstances, and suggested that all calves should be sent to slaughter facilities to ensure regulated and humane standards are adhered to and some value is obtained from the meat (MIA, 2014).

There are ethical concerns which relate to the killing of an animal at all, or at such a young age. In addition to this, the separation of the calf from the cow at birth is another ethical issue of concern. Ethics can be very value, beliefs and perception based.

Wastage is the third reason for concern, with many people unhappy that the surplus calves are not reared to gain further production and value from them.

This practice is of increased prevalence in countries that have a farm system based on the pasture supply curve and therefore a concentrated calving period, such as New Zealand, Australia, and Ireland. This results in a large number of surplus calves being born in a short period of time in the spring and no market for a significant number of these. In other countries such as the U.S., they have housed dairy systems in which they can calve in batches or all year round which spreads out the timing of supply of surplus calves. These countries also have more intensive systems for finishing cattle such as feedlots or housed veal systems in which harvested feed is bought to the animals. These can accommodate many of the surplus calves to rear. Whereas in New Zealand, we are primarily a free-range pasture-based system and cannot accommodate such large numbers of surplus calves without significant displacement of other existing farming systems. Australia and Ireland are two countries that are more similar to New Zealand, with concentrated spring calving the common practice.

However, both have much smaller national dairy herds and also have some alternative systems available to accommodate these calves. In Australia there are a number of feedlot systems for finishing cattle and also a large cropping industry to supply grain into these systems. In Ireland, in addition to many being retained for beef finishing systems, another common outlet for surplus dairy calves has been live export of calves at a young age to Europe where they are finished in well-established veal systems, in 2018 there were approximately 200,000 bull calves exported live for veal production (Kelleher, 2019).

The following table gives an idea on the scale of the problem of bobby calves relative to these other countries and why this topic is of increased risk to our social licence to operate here compared to some other countries. Note these numbers are estimates based on a range of sources of information and some numbers have been rounded. New Zealand has the largest percentage of bobby calves slaughtered relative to national dairy herd size, and also the largest population slaughtered in total.

Table 1: Indication of dairy herd size in different countries and the number of calves slaughtered as bobby calves.

	New Zealand	Australia	Ireland	USA
Number of dairy cows	4.95m <sup>1</sup>	1.5m <sup>4</sup>	1.5m <sup>7</sup>	9.3m <sup>10</sup>
Number of dairy farms	11,300 <sup>2</sup>	5,800 <sup>5</sup>	18,000 <sup>8</sup>	34,000 <sup>11</sup>
Number of bobby calves	1.8m <sup>3</sup>	400,000 <sup>6</sup>	30,000 <sup>9</sup>	90,000*
% of bobby calves relative to herd size	36%	26%	2%	1%

\*Approx. 15%<sup>12</sup> of all veal (587,000<sup>13</sup>) is 'bob veal'

Sources: <sup>1,2</sup> DairyNZ (Jan 2019). <sup>3</sup> Statistics NZ. (2020). <sup>4, 5</sup> Roadknight & Fisher (2018). <sup>6</sup> Dairy Australia. (2020). <sup>7, 8</sup> IFA. (2020). <sup>9</sup> Kelleher (2019) and Department of Agriculture, Food & Marine. (2019). <sup>10</sup> Economic Research Service, USDA. (2020). <sup>11</sup> AgWeb. (2020). <sup>12</sup> USDA (n.d.) <sup>13</sup> USDA (April 2020).

#### Industry vision, goals, and market positioning

It is important as an industry that we ensure our practices throughout the supply chain are meeting what we specify in our industry visions, goals and marketing campaigns i.e. we must do what we say.

The Minister of Agriculture established the Primary Sector Council to develop a shared direction for the food and fibres sector. The primary sector has agreed a vision and strategic direction for its future 'Fit for a better world'. (Fit for a better world, 2020). This plan includes the following key points:

- *We aspire to an enriched future by providing the world's most discerning consumers with outstanding, ethically produced food, natural fibres, drinks, co- and bioproducts, all sourced from our land and oceans.*
- *We are committed to meeting the greatest challenge humanity faces: rapidly moving to a low carbon emissions society, restoring the health of our water, reversing the decline in biodiversity and, at the same time, feeding our people.*
- *Getting fit for a better world is key. We have identified five elements that are crucial to making that happen:*
  1. *A regenerative mindset: thinking about what we can regenerate in our ecosystems.*
  2. *A Taiao approach, and we talk about that in more detail below.*
  3. *Our commitment to ethical production systems.*
  4. *Delivering outstanding products for discerning consumers around the world.*
  5. *We need to make the most of our New Zealandness in everything we do.*

In addition to this, the Dairy Tomorrow Strategy is focussed on the key challenges and opportunities that face the dairy sector today – and importantly, into the future (Dairy Tomorrow, 2017). This strategy includes the following points:

- *'...an awareness of the need to be ahead of potential shifts in consumer and public expectations or perceptions over time.'*

- *Goal 4.1. – Develop and implement a Framework that ensures every animal is valued and treated with care and respect.*

The 'Taste Pure Nature' marketing tool kit from Beef + Lamb NZ and the 'Made with Care' campaign and tool kit from NZTE and NZ Story are other examples of material that exists promoting how we grow and create products in our primary industries (Beef+LambNZ, n.d.) and (NZ Story, 2020).

The early slaughter of calves is a practice that could be challenged in its ability to meet these various visions, goals, and marketing campaigns both now and in the future. We need to ensure going forward that our practices have the ability to be adapted to meet these.

#### 6.2.1.1 *Different perceptions that exist and the risk to social license to operate*

Social license to operate is a term that is more frequently used amongst businesses, and in particular in our agricultural industry with reference to the environment and animal welfare. It can broadly be described as the ability of an organisation to carry on its business because of the confidence society has that it will behave in a legitimate, accountable and socially and environmentally acceptable way (Sustainable Business Council, n.d.)

Despite significant improvements in the welfare requirements for bobby calves over recent years through the Code of Welfare and extension and education on best practice within the industry, there remains an increasing risk to the industries reputation and social licence to operate.

There has been a disconnect and a lack of understanding from many consumers on dairy industry practices, the requirement for a calf for lactation to occur, the surplus of calves that this results in and the fates of those calves (Horizon Poll, 2017). However, in more recent years we have seen a shift in consumption patterns with more sophisticated and demanding consumers what are more worried about the content of their food, its origin, freshness and safety, the sustainability of food production and its impact on the environment, and animal welfare. In short, there has been a growing interest from consumers in how their food is produced. While public concern about animals used by humans is not a new phenomenon, it has increasing in importance in more recent times (Alonso *et al.* 2020). This has seen awareness surrounding the dairy industry and surplus calves start go grow.

We have also seen a progression in thinking on animal welfare from the '5 freedoms' towards 'a life worth living' or 'a good life' which can simply be defined as an animal that has what it wants and what it needs.

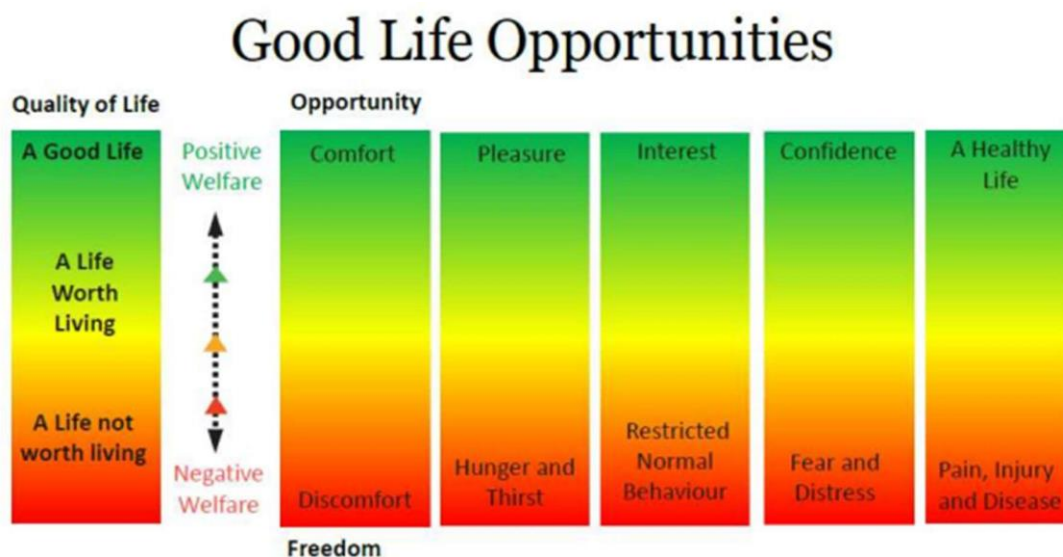


Figure 1: Diagram of 'Good life opportunities.' Source: O'Leary (2018).

Social connectivity and technology empowers consumers to be hyperconnected and to scrutinise all aspects of food production (Dairy Tomorrow, 2017). Increased availability of information and the ease at which we can access it with the internet is aiding the growing interest and knowledge which is changing consumers views in relation to animal welfare and livestock production. Social media platforms have further enhanced this and provided a platform for people to share their views more easily and influence others thinking.

Animal welfare is a 'wicked problem' that is complex in nature with many different perceptions on animal welfare based upon peoples' beliefs, values, emotion, experiences, and factual knowledge. While there is plenty of science underpinning animal welfare standards, reality is that it is often human perception, knowledge and opinions that can drive regulations or changes in practices. This can either be through voicing their concerns publicly to influence change in regulation, or through purchasing behaviour and thus demand for product dependant on the credence attributes sought, which can include animal welfare.

#### Examples of public perception effecting social licence to operate

The industry's social licence to operate is coming under increasing pressure based on many perceptions on the practice of slaughtering large numbers of surplus calves at a very young age in order to produce milk. This includes calves sent to abattoirs and those euthanised on farm. In addition to this, the practice of cow-calf separation is under increasing scrutiny.

In recent years there have been a number of incidents which have increased the profile of practices in the dairy industry. These include numerous videos from organisations such as SAFE and Farmwatch on the handling of calves on farm and during transport.

In addition, there have been increasing messages from activists aimed at consumers to raise the public awareness of practices that occur. Two examples include:

- SAFE erected the billboard below in the CBD of Auckland outlining the issue of cow-calf separation which also has an accompanying video on YouTube.
- SAFE ran a \$10,000-plus advertising campaign that included the one-off print ad in The Guardian newspaper in the UK and two weeks of online advertising, aimed at highlighting the issue of 'New Zealand dairy contaminated with cruelty'.



Figure 2: Billboard erected in Auckland CBD by SAFE. Source: Scoop 2017



Figure 3: Ad ran in The Guardian newspaper by SAFE on NZ dairy. Source: (Maxwell, J. 2017).

In summary, bobby calves and those euthanised on farm at birth are a complex issue facing the industry. They now have an inherently low monetary value and there is a lack of on-farm infrastructure



to rear all the surplus calves as well as high costs and labour inputs required for this. There is growing pressure to reduce or even eliminate early slaughter of these calves due to risk to the industry with public image and social licence to operate. Many interviewees and industry observers are questioning how much of an issue this topic really is. There is a more scientific angle that argues that standards and practices adhered to now ensure the calf is free from any compromise to welfare. However, many citizens assess animal welfare in a moral and ethical context too. So, while the former may argue that providing information to educate and improve understanding and acceptance of the practice is one option, in reality it is very difficult to try and educate away people's values (Bolton, 2018). Despite the debate, it is largely agreed at an industry level now that the scale of the problem in terms of number of animals in this category is something that we must look for solutions to reduce, before perception and emotion have any significant impact on our ability to operate or the markets we can work with.

### 6.3 Concerns within our value chain on the associated risk

This section of the report is based on conversations and interviews conducted with a range of people across the industry.

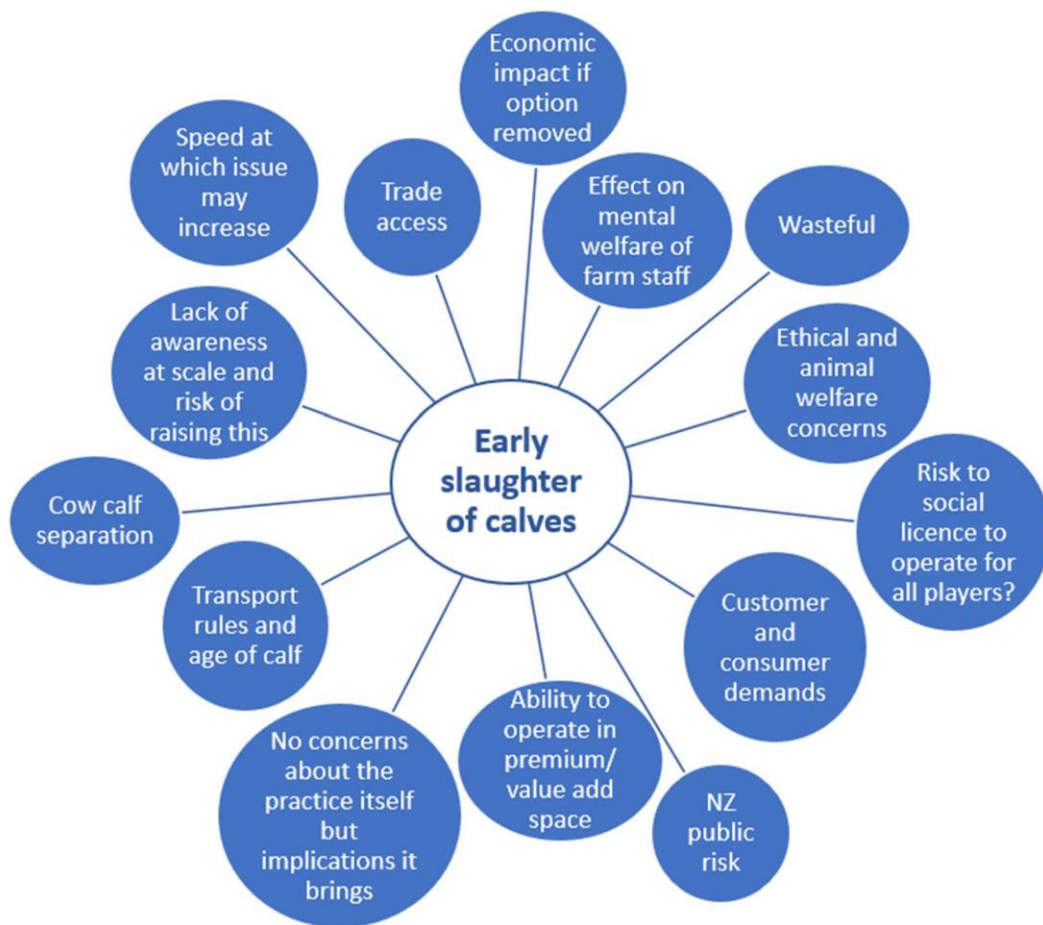


Figure 4: Key themes from interviews and literature review regarding the early slaughter of calves

Most did not have concerns themselves personally with the slaughter of bobby calves from an animal welfare perspective and thought that the chain of care had significantly improved in recent years. Many did however have issues with being wasteful and thought it was a waste having such large number of calves killed at a young age instead of being reared for longer to gain more value.

While slaughter at a young age is the commonly referenced issue, there are other issues with this topic that may be of more concern. Often the pre-cursor to this conversation is the perception around the cruelty associated with cow-calf separation and some interviewees were of the opinion that this is of greater risk to the industry than early-life slaughter.

In addition to this, many saw the euthanasia of new-born calves on farm more of an issue than bobby calves sent for processing. The concerns here are two-fold. There is a worry around practices associated with euthanasia on-farm and if animal welfare requirements are met regarding humane slaughter. This is particularly relevant following many photos and videos shared in recent years indicating some inappropriate practices. In contrast to this, some farmers feel that it is a more ethical and humane option to slaughter these calves on-farm than waiting four days and then the calf enduring often long transport distances, time in yards and the repeated handling in the process for slaughter at processing plants. Despite this, there are serious concerns for mental health in the rural sector in general and in addition, what impact euthanising calves on-farm has on adding to mental health problems. Farmers spend their days caring for their livestock and none of them like having to purposely slaughter large numbers of animals at a young age.

All interviewees were very concerned about the risk that bobby calves may pose in the future to our industry's social licence to operate. This was largely due to their understanding of increasing consumer awareness and the perceptions that many have on bobby calves. It was considered a *'ticking time bomb and could break the camel's back in terms of our ability to export and get access to markets'* and *'our Achilles heel waiting to burst.'* It is one of the many perception problems that is in the picture, although probably down the slightly. One milk processor indicated it is in their top 5 issues for farm risks.

A relatively common theme that came through from all participants was that in general consumer awareness is still relatively low as to the fate of bobby calves and also the scale in terms of total numbers slaughtered here in New Zealand. A lack of understanding of farming systems is common. Survey results from a survey in 2017 by Horizon Poll has exposed how little awareness the general public has of dairy industry practices. It showed 50% of people either thought it was false or did not know that a cow needs to give birth each year to produce milk. While over 80% of the public vastly underestimate the number of bobby calves killed per year (Horizon Poll, 2017).

Despite this, it was acknowledged that awareness is starting to grow and will likely start to grow at pace, and the industry needs to be proactive to find solutions before it impacts businesses. However, care needs to be taken during this process to try and negate any unintentional consequences of further raising the awareness profile of bobby calves – *'we need to be proactive but do it quietly.'*

The issue is definitely on the minds of many farmers and a number are starting to try and reduce or eliminate the practice on their own farms. However, there was clear frustration from some farmers and a worry that logic is going to lose out to emotion before economic impact is properly understood and solutions found. There was a strong sentiment that our ability to make changes to the bobby calf system with a view to satisfy ethical opinions, must involve solutions that still allow all players in the value chain to maintain an economically viable business. More regulation at a farm level that significantly increased costs without an economic benefit, would have a significant economic impact on the whole dairy industry. One view was that premiums must be obtained to pay for the increased costs associated. It was also noted that many international farming systems did not need the same returns due to subsidies to farmers to help cover costs and care was therefore required when comparing our systems and ability to implement changes to align with international systems.

While some agreed we need to be proactive in addressing this, others wondered if the risk was being overstated and it was just the loud opinions of a few causing this topic to escalate and the impact on demand for our product wouldn't occur – *'there will be a need for people to buy our product, the world*

*is hungry*'. The relevance of this point is likely dependent on the milk processor and their strategy and position in market with the products they make. One milk processor pointed out that those with more of a commodity focus and ingredient based market would see less risk, while those operating in a B2B and added value space have a much higher risk and issues like bobby calves close down some of their opportunities to move up the value chain. In addition, it is very dependent on the markets chosen, affluence of those consumers and product attributes they value and can afford to pay for e.g. sustainability and welfare versus food safety and nutrition. It is important to note here though that consumer demands don't always reflect their actual purchasing behaviours. Many consumers do intend to consume ethically, but various purchase barriers hamper them and other demands get in the way, for example despite the concerns for animals, they care more about price (Cornish *et al.* 2019).

While many realised that it was an industry wide issue, most felt that the risk was likely higher for dairy farmers and milk processors in the first instance given bobby calves are a by-product from their supply chain – *'they own them and have to take the first responsibility, they need to push the way for another option for them to be used.'* Some did comment that despite primarily being a dairy issue, they had the potential to tarnish our whole industry image.

One interviewee also highlighted that the risk may be higher than consumer or NZ public pressure and in fact sit at a trade access level. It was noted that with free trade negotiations with the EU post Brexit, the topic of bobby calves is popping up. They have very different standards there (e.g. 10 days before transport) and could ask for equivalence in standards during negotiations which is a risk (although likely low) to our industry and the way it operates currently. Current or future negotiations like this may further highlight internationally the scale of our issue with bobby calves in New Zealand and this has the potential to cause more trade barriers (or customer access barriers) for our primary industry products exported. The risk will be heightened as other producing markets move to eliminate all bobby calves and there will be an expectation that we need to follow suit to maintain our brand image in terms of being the best in the world with producing milk and beef. There are some examples of this starting to occur. For example, Arla is a global dairy company and co-operative and the Arla UK 360 is a standard they have in the UK. The Arla UK 360 programme covers the six areas essential to building a profitable, responsible dairy farm business. It incorporates best practice in today's dairy farming across animal health and welfare, people development, environment and natural resources, community engagement and economic resilience and reinvestment, and will then drive a vision for research and development areas that will lead the UK dairy agenda. Included in the standards is the requirement that no healthy calf be shot or slaughtered before eight weeks of age so, the move will support farmers by guaranteeing a home for every calf. UK grocery retailers Aldi and Morrisons are supporting this standard. Morrisons now allows bull calves from dairy suppliers in the Arla UK 360 programme to enter the rearing units with their beef partners, Buitelaar production (Arla Foods, 2019). So while topics such as restrictions on practices with bobby calves may be still a lower risk and some way off at a trade barrier/access level, the speed at which commercial decisions are made is much faster and we are likely to see increasing customer access barriers having the same, if not greater, effect on our industry.

While there is debate on early-life slaughter as an accepted practice at all, there is also much discussion on the regulations that go alongside early-life slaughter which have been significantly improved in recent years in New Zealand. However, the previously mentioned point of minimum age required before slaughter is another issue arising with New Zealand currently at four days and many other countries with higher standards such as the UK at 10 days. Many interviewees agreed that the standard needed to increase here. However, if this were to change then many interviewees suggested this would further escalate the number of calves euthanised on-farm. It was also noted that age alone was not the issue, and it was about fitness of the calf, distance to travel and time before slaughter. A matrix for decision making is required and not just an age alone.



### 6.3.1 Reducing or eliminating bobby calves

It was generally agreed that the industry needed to work to reduce the number of bobby calves in the first instance and that aiming for elimination is unrealistic currently and a much longer-term goal to have. There will always be some calves that are just not appropriate to be reared and these require a humane method for slaughter, so we must not completely give away our ability to process bobby calves. This means care must be taken when considering how far we aim to reduce our numbers with two interviewees noting that if bobby numbers got to a point that they were too low (800,000 was one number suggested) that this industry was no longer viable to operate. If this was to occur then slaughter of bobby calves in processing plants may reach a point where it is a service provided to the dairy industry at a cost where calves are humanely slaughtered and rendered.

For reduction to be achieved, there is a strong need for the dairy and meat sectors to work more collaboratively together. There were many opinions that this has been a barrier to date in making progress on this. In order to achieve either a reduction or elimination, existing enterprises would need to be displaced and it would require a change in land use. Some thought this was probably likely to occur to some extent anyway with other forces that are in play now such as environmental regulations, and this might aid the willingness to look at options such as veal. There was a view that both beef breeding cow numbers and dairy cow numbers would need to reduce.

It is clear that there is no silver-bullet to significantly reducing or eliminating the number of calves slaughtered at an early age given the scale of our numbers. It is well recognised that a combination of multiple solutions would be required to work towards this.

There are a number of solutions that have been proposed that exist to help reduce the number of bobby calves including; reduced cow herd/stocking rates while increasing milk production per cow, sexed semen, increased use of better beef genetics, a veal system, extended lactation, hormone induced calf-free lactations, split season calving to spread the supply of dairy calves, and live export.

This following section of this report is focussing on looking in more depth at just one of these options, a veal industry in New Zealand.

## 7 Veal

### 7.1 What is veal?

Definitions of veal, while similar, do vary between publications and countries. Generally speaking, veal is the meat of a calf under the age of 12 months. However, the term veal is quite broad and within that there are numerous sub-category names associated with veal.

‘Bobby veal’ is typically from animals less than 30 days of age. In some countries there may be a weight limit associated too.

‘White’, ‘milk-fed’, ‘special fed’ or ‘formula-fed’ veal is typically veal that is raised on milk which is often a formula or milk replacer along with some other feed such as grain, forages or mixed rations (usually low levels but enough to meet the minimum requirements that exist). These are specially controlled diets that are often low in iron. This meat is usually very pale or white. These calves are usually slaughtered at younger ages e.g. often 6 to 9 months.

‘Non-special fed’, ‘Pasture-raised’ or ‘Rose veal’ is veal from calves that are fed a variety of diets including milk, grain, and forages. These diets are usually more normal diets with no restrictions on iron intake. The meat is usually a lot redder and often described as a ‘rosey’ colour. These calves are usually slaughtered between 8-12 months.

Some countries specify that veal is those animals that are less than 8 months of age, and the term ‘young beef’ must be used for 8-12-month-old animals. In Europe, the labelling of veal is controlled by

EU legislation. There are two main categorises, according to the age at slaughter, with 'V' denoting less than eight months and 'Z' between eight and twelve months (Burke, 2015).

Veal comes from two sources, surplus dairy cross-bred calves from the dairy industry and reared artificially, and from suckler breeds where calves stay on their mothers to drink, with the former being the most common source internationally.

The veal product itself is a tender and lean meat that is a high quality protein with less fat than beef and is rich in nutrients including vitamin B-6, vitamin B-12, niacin, riboflavin, zinc, selenium and choline (Veal made easy, n.d.). There are likely to be reasonably significant differences between bobby veal, milk-fed veal and rose veal with eating experience.

## 7.2 International veal systems

### 7.2.1 History of veal

Veal is an ancient culinary tradition that dates back to biblical times. Intensive rearing of calves for veal was developed in the 1950s, largely in Europe and the U.S, to utilise the surplus male calves in the dairy industry (McKenna, 2001).

Many of these farms used systems in the 1900s included tying the calves up in small crates or stalls to restrict their movement, keeping them in the dark, and feeding them solely on milk. These systems were developed to restrict iron intake and keep the meat very pale pink colour, known as 'white veal'. This is commonly known as the veal crate system.

However a number of high profile campaigns ran by NGOs in the 1980s with pictures and details of the way in which calves were raised in veal crates led to many consumers turning off veal, and also a change in regulations and standards for veal production including the banning of veal crates in the EU industry from 2007 (McKenna, 2001), the UK from 1990, with the U.S. having also transitioned to group housing since 2017. Some individual housing is still allowed prior to 8 weeks of age.

Despite significant improvements in practices, the name 'veal' is still highly associated by consumers with the historic production systems involving veal crates.

International systems utilise two by-products from the dairy industry, the surplus calves and also whey for milk formula which is a by-product from making cheese and skim milk (Veal the book, n.d.).

### 7.2.2 Veal internationally

Internationally there are significant veal industries that exist already, with production and consumption largely occurring in Europe and the US.

In terms of global veal production, the Netherlands leads the way with approximately 1.5 million calves processed, and France is the second largest producer. Other countries with significant veal production include Italy, Belgium, Germany, US and Canada. (Hayley, 2015).

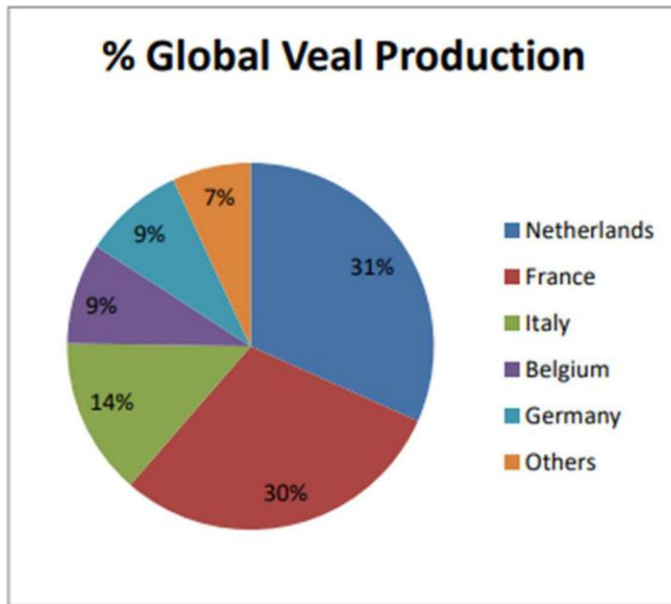


Figure 5: Percentage of global veal production by country. Source: (Hayley, 2015).Percentage of global veal production by country. Source: (Hayley, 2015).

In 2015 it was calculated that farm gate sales of veal were almost 1 billion Euros annually and retail value of veal sales to consumers were approximately 3billion. (Hayley, 2015).

While there are several countries that consume veal, it is most common in Europe and often considered a luxury product there, especially if it is milk-fed veal. France leads in veal consumption on a per capita basis at 3.5kg/per person annually due to it being a strong part of their culture, their cooking heritage, and the availability in both retail and restaurants. In comparison, in Canada annual per capita consumption is only 0.87kg/person and the US for 0.14kg/person (Hayley, 2015). It is interesting to note that while The Netherlands is the largest producer of veal, they are not large consumers, and most is exported.

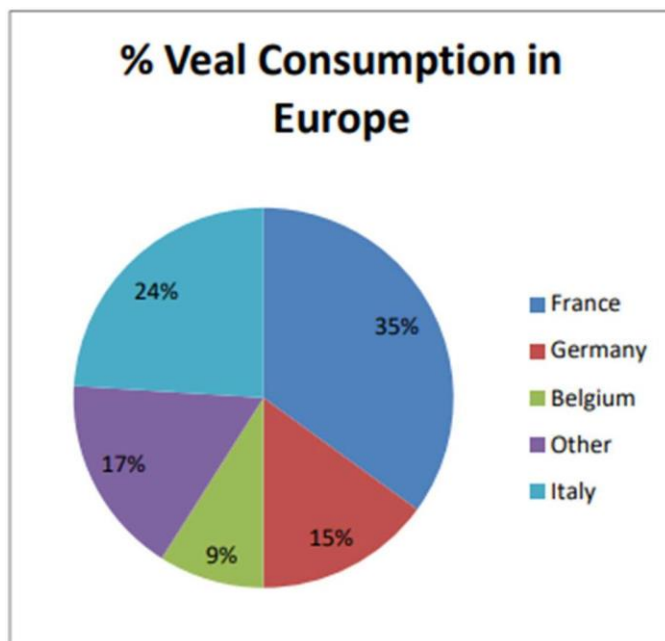


Figure 6: Percentage of veal consumption in Europe. (Hayley, 2015).

### 7.2.3 Examples of some international veal systems

#### Buitelaar Group - UK

Buitelaar Group is a UK based company that produce both beef and rose veal. In 2018 they produced 60,000 calves with 5 calf collection centres, 32 rearing units and 386 finishers.

Calves are purchased from dairy farms by Buitelaar and taken to their calf collection centres which sole purpose is to improve the sustainability within their supply chain. They help improve animal welfare, provide a sustainable pricing mechanism for the dairy farmers and the calf purchasers and also enables them to specify batches of calves (gender, breed, grade, age) according to farmers' own requirements. Dairy farmers receive a price per head based on weight, age and breed.

Calves are then placed into rearing units up to 4-5 months old and approximately 150kg. Buitelaar underwrites the value of the calf to ensure finishers know how much profit per head they can make. Buitelaar also supply the milk powder and helps to group purchase feed, with all veterinary work undertaken by Synergy Vets – this is the farmers' expense.

There is a technical team to help dairy farmers supplying calves to improve their calf management as well as other areas of their supply chain. A tracing system to track how calves have performed, rank their farmers, and information is supplied back to dairy farms to help improve the quality of calves being sourced. If they have better quality, then Buitelaar can pay more because they do better in the system.

Buiteelar also have a relationship with Morrisons as their beef rearing partner for those farmers participating in Arla UK 360 Standard, as mentioned earlier.



Figure 7: Buitelaar Supply Chain. Source: Buitelaar Group (n.d.).

#### VanDrie Group - The Netherlands

In the Netherlands, both white and rose veal calves are reared. White veal calves are up to an age of more than 25 weeks and average 225kg, while rose veal calves are either 30 weeks and 300kg or 40 weeks and 360kg. Rules include that calves must be kept individually until 8 weeks of age and then in group housing after that typically in groups of 8-75 animals. White or milk fed calves are fed milk

powder plus small amount of fibre-based feed (50-250g/day), while rose veal calves are fed a lot more fibre.

There are approximately 1.5 million veal calves slaughtered in the Netherlands, and the figure below indicates the proportion of calves that are younger than 9 months (blue) and those between 9-12 months (orange).

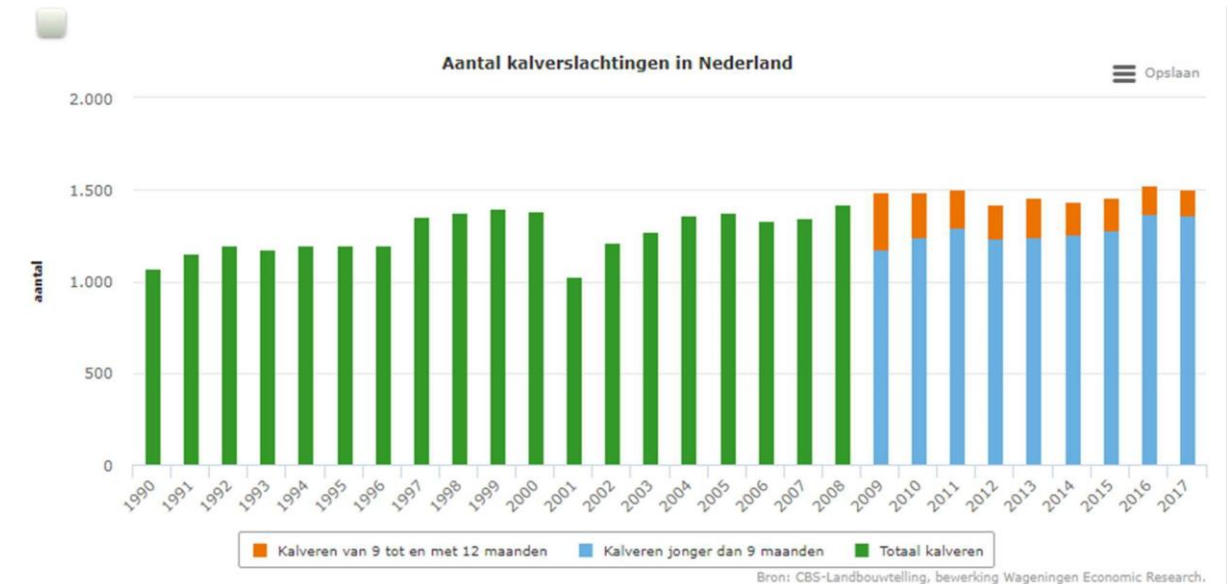


Figure 8: Number of calf slaughtered in the Netherlands (millions). (Wageningen University & Research, 2018)

Most veal production in the Netherlands has a system in which companies own the calves, contract veal rearers, supply the feed, and slaughter and market the product themselves. They operate at large scale and have the ability to offer reliable income for the rearers.

The VanDrie Group is the world's market leader in veal and the Netherlands' largest privately owned agri-food business, exporting veal to more than 60 countries with a turnover of 2.2 billion and net profit of 92 million (VanDrie Group, 2019). They have fixed contract arrangements with 1500 veal farmers rearing 1.6million calves for veal, have their own feed companies that produce calf milk and feed/muesli in The Netherlands and Italy, have their own slaughterhouses in The Netherlands, Belgium and France, along with a company they own that processes the skins.



of 475 to 500 pounds. They are typically fed on milk replacer, which is often made utilising whey from cheese plants to further support the dairy industry, and grain.

Since the end of 2017 all US veal farms have raised their calves in group housing, ending any single stall crates. A number of people are starting to regain an interest in veal in the US now that there has been a shift to group raised veal (Moenning, 2018).

## 8 A New Zealand veal industry

The following findings and discussion are largely based on the interviews completed with this project, combined with my critical analysis of these and information discovered looking at information available on international systems and how these compare.

A veal system in New Zealand has the potential to allow a much larger number of calves to be finished compared to our more traditional beef systems which are typically slaughtered at 20-30 months, compared with veal which is less than 12 months.

Currently New Zealand's veal industry primarily consists of bobby veal and there is no well-established veal industry here. Yet internationally, there are significant veal industries that exist, particularly in Europe and the US.

While there are many challenges, it appears there should be significant potential for a veal industry in New Zealand with a large surplus of calves currently 'wasted' and available to utilise, and a growing world population that needs feeding with safe, healthy and nutritious food.

Previous reports have alluded to the fact that if margins were economical and markets could be established, veal could be of huge value to the sector (Jolly, 2016). Further investigation into this is required. Massey University have recently begun some research looking into different areas of veal, under a project called 'New Generation Beef' including meat quality, growth rates, economic analysis and farm system modelling. Some results from this are referenced in this report. This research is on-going.

## 9 Findings & Discussion

The following diagrams demonstrate the key themes that came from my literature review and interviews.



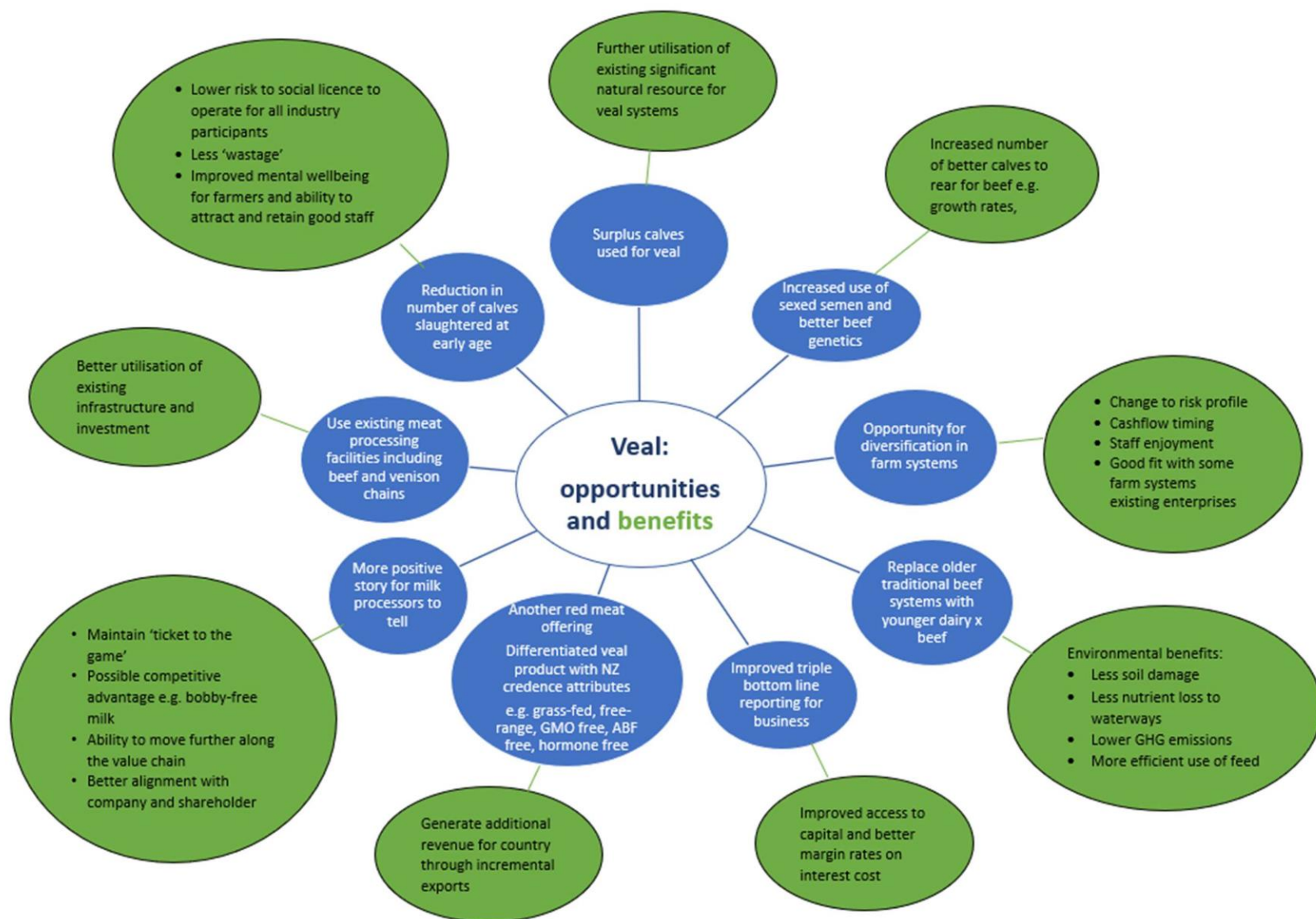


Figure 10: Key themes from interviews and literature review regarding the opportunities and benefits of a veal industry in New Zealand





Figure 11: Key themes from interviews and literature review regarding the constraints and actions required or consequences of a veal industry in New Zealand

## 9.1 Potential for a NZ veal industry

All interviewees thought that providing it was economically viable and competitive with existing enterprises, that there was significant potential for a veal industry in New Zealand given the natural resource, the bobby calf, is already present in our systems. It would provide another diversification option in the red meat proteins we offer as a country and would allow an extended life for surplus calves and more utilisation of that to produce product.

There was a strong sentiment from many interviewees that we have to find solutions to reduce the numbers, with many hoping that an economic veal industry can be one piece to that puzzle. While all could see huge potential for this, the most common answer given was that serious modelling alongside market research needs to be completed to work out how it can work economically.

When questioned on why we do not have a veal industry already given the resource to do so exists and veal is an established product internationally, there were no strong answers but some guesses:

- *Just our history and the way we have done it*
- *The seasonal aspect makes it too challenging with all calves arriving into the system in a short time-frame, compared with all year calving internationally.*
- *New Zealand's pastoral system versus international housed systems*
- *Because our export beef systems are already so strong (prime, bull etc.) so why do we need to bother with veal domestically*
- *We have been spoiled over the last century with good access to good quality meat and haven't had to look for something like veal. Whereas in Europe, a rump steak is somewhat of an idyllic item.*
- *People don't know how to cook it and tend to buy things they already know how to cook.*
- *There was some recollection of veal being available a long time ago at butchers, although how or where this was produced was unknown.*

## 9.2 What veal system for New Zealand?

Once that various types of veal systems that exist currently were explained to interviewees, there was unanimous agreement that New Zealand should only adopt a free-range, pasture-fed type veal system. With this approach, most believed that a 10-12 month age animal was the most likely option to suit our farming systems here based on growth rates achievable in the pasture based system.

From a meat quality perspective, some research in New Zealand has looked at the meat quality of dairy origin steers at light-weights before one year of age. Animals were slaughtered at eight, ten and twelve months. The results showed that there were some statistically different results in various meat quality attributes (see Table below). However, the key message from findings was that differences were unlikely to be large enough to impact on the eating quality or value of the product. Overall, the results indicated that meat from the yearling dairy-origin cattle was tender and high quality at all slaughter ages. (Pike *et al.* 2019). This suggests that from a meat quality perspective, the age from a veal system prior to 12 months is no concern. These results did not look at nutritional aspects to meat quality.

Table 2: Means for meat quality attributes of the striploin from Hereford x Friesian-Jersey steers aged 8, 10 or 12 months (n=20 per group) at slaughter. Source: (Pike et al. 2019)

Meat-quality attribute	Slaughter age (months)				Covariate P value
	8	10	12	SEM	
pH	5.31 <sup>a</sup>	5.58 <sup>c</sup>	5.52 <sup>b</sup>	0.01	Ultimate pH
Meat colour					-
L* (lightness)	42.03 <sup>a</sup>	39.71 <sup>b</sup>	36.33 <sup>c</sup>	0.61	<0.001
a* (redness)	12.29 <sup>a</sup>	14.97 <sup>c</sup>	13.86 <sup>b</sup>	2.59	<0.001
b* (yellowness)	3.44 <sup>a</sup>	4.93 <sup>b</sup>	4.46 <sup>b</sup>	0.21	<0.001
Water-holding capacity					
Thaw loss (%)	1.8 <sup>b</sup>	1.0 <sup>a</sup>	3.3 <sup>c</sup>	0.2	NS
Cooking loss (%)	28.7 <sup>a</sup>	27.8 <sup>a</sup>	26.5 <sup>b</sup>	0.3	NS
Drip loss 48h (%)	5.7 <sup>b</sup>	4.1 <sup>a</sup>	6.4 <sup>c</sup>	0.6	NS
Tenderness					
Shear force (kgF)	5.1 <sup>b</sup>	4.6 <sup>a</sup>	5.6 <sup>b</sup>	0.3	0.05
Sarcomere length (µm)	1.72 <sup>a</sup>	1.74 <sup>a</sup>	1.75 <sup>a</sup>	0.1	NS

Values within rows that contain the same letter in their superscripts are not significantly different at the P<0.05 level.

However, one of the biggest challenges we have is having enough land to finish all the veal, so it was suggested we shouldn't rule out more of a 'milk fed' system with a younger animal (approx. 4-6 months) at weights of approximately 150- 220kg if it was economic, as it would allow far greater numbers of calves to enter the veal system. These are typically fed on milk and some sort of starter feed. The consumer and public perceptions on these systems versus bobby veal would need to be understood, along with the market opportunities. One interviewee suggested that milk-fed veal will not meet our social licence expectations. There is certainly an existing market for this sort of milk-fed veal, but whether New Zealand could compete in this space or want to, is another question.

There was a general view that New Zealand should focus on the credence attributes that we are focussing on with our other red meats to attract premiums such as grass-fed, free-range, antibiotic free, GMO free, and hormone free. One point that was raised was our current practice of feeding calf-meal during rearing and whether under a veal system the ingredients may get further questioned if making claims such as grass-fed.

### 9.3 Farm systems

There are a number of questions as to who our producers would be in a veal system – where are they located, how will they rear and finish the calves, resources and limits, capacity to handle risk (and appetite for), what changes are required to their system, what skills do they need to acquire etc.

Farm systems would need to be developed to ensure a veal system could be integrated into existing systems including dairy farms, calf rearers and finishers. Farmers have different values and operate different policies so it is impossible to make a recommendation that will suit everyone. There are a number of options for what this might look like at a farm level and is likely to be a mixture of these in terms of what role different farm systems take at different stages.

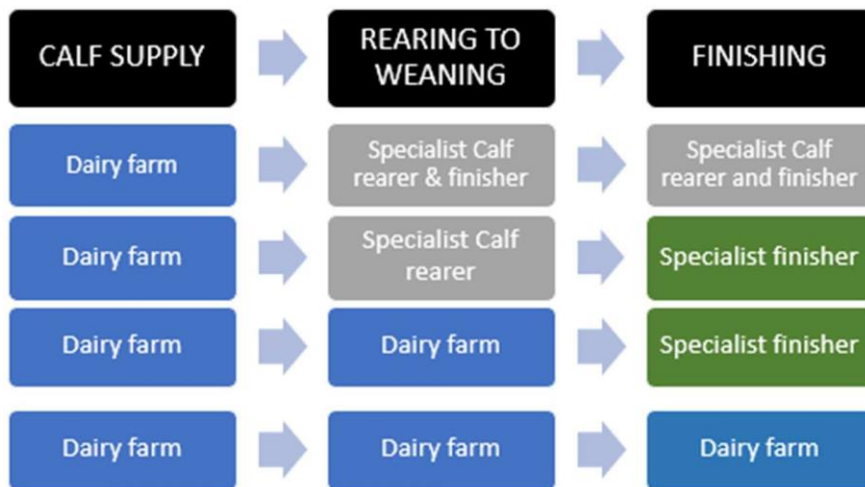


Figure 12: Example of the potential supply chains within farm systems for veal

The first role sits with the dairy farm where the critical point is the availability of calves that are fit for purpose for a veal production system including health, ability to grow quickly and the final product. Some key factors include the breeds, sex of the calf, and timing.

#### Breeds and genetics

Internationally Friesian bull calves are the most common breed used for veal from the surplus dairy calves.

Jerseys have been noted as the primary issue when it comes to breeds due to their size and growth and therefore lack of finishing market to sell these into, and also their yellow fat which has historically been perceived as worse. Although what this fat colour looks like at a younger slaughter age may need to be further investigated. It was suggested that this breed is unlikely to suit a veal system. Although one person did suggest that there could be a good marketing story to develop here with less of them in total to deal with, the potential to tell a better story around yellow fat and pasture fed, and their exceptional eating quality.

With only a percentage of heifer calves required for replacements, there is the ability to utilise beef genetics over a portion of the herd including poorer performing and later cycling cows, through either natural mating or artificial insemination. Dairy farmers typically want genetics that are easy calving and have a shorter gestation to allow for more days in milk. Calf rearers want calves that are easy to rear in terms of health etc., grow well and that have a demand from finishers to purchase. Beef farmers want calves with high growth rate potential and good carcass yields.

Most dairy farmers produce from beef sires of unknown genetic merit, with resulting animals less desirable to rearers and finishers because their potential for growth and meat quality is unknown. New Zealand dairy farmers traditionally mate cows to high BW AI sires for the first four to six weeks for mating to create herd replacements. The balance of the herd is then mated naturally, with the tendency to mate tail-end cows with Jersey bulls (Jolly, 2016).

However, we are now starting to see an increased focus from dairy farmers on using better beef genetics with proven genetic merit to provide more desirable calves for the dairy industry. A lot of more traditional beef breeds have typically been used such as Angus or Hereford. More recently there has been an uptake in the use of other breeds such as Belgian Blue and Speckled Park.

Sexed semen is another option to allow further use of beef genetics. Its use in the dairy herd has seen a huge increase (tripled) in demand this season, with this expected to double again next season. This is allowing farmers to focus on getting more replacements from the top end of their herd which in

turn means there is more room to utilise beef genetics across the rest of the herd. Despite higher costs, the benefits stack up in terms of the increased breeding worth and higher genetic merit gained, this doesn't include the additional benefits of milk solid value. There are some challenges with sexed semen including:

- Frozen versus liquid semen – it gets damaged in the sexing process which impacts on conception rates, freezing on top of this process further effects this.
- Viability of semen in the field is shorter so has to be delivered daily instead of every 3 days which means increased constraints with logistics
- Time and space – one machine and person can only generate approximately 200 straws/day and peak season for AI sees huge numbers required.
- Higher cost (approximately 3x) – looking at \$60 for calf in the cow versus \$20

There was good consensus amongst interviewees that there was a huge opportunity to create more value in the industry by using more beef breeds with good genetics. There is some cost to this process though including more expensive bulls or semen, with more cost and inconvenience with longer AI periods which is very tiring for staff and would impact on a period when they start to get more of a break. It was also suggested it would likely result in an increased maintenance cost (Jerseys) for the cow while pregnant due to a bigger calf which would be at a cost to pasture otherwise consumed for body condition score or milk in the vat.

A market and economics are what will drive the uptake, along with the preference to do something that creates a better news story than bobby calves. But ultimately, to really drive change in this space of more use of better beef genetics then we need some guarantee that there is a market for them at the end. One farmer even noted he would pretty much give them away if he knew there was a market to take them and they could be gone at four days old. The opportunity cost was bobby calf prices which was a very small opportunity cost and a less favoured outcome for the calf.

One large supplier of beef genetics for the dairy industry have increased their focus on marketing of their beef offerings to help with uptake, and have also developed a cross breed beef selection index so make it easier for dairy farmers to select a bull that suits their requirements. They are putting significant investment into the dairy beef space including the progeny tests and trying to develop their own beef animal that will combine the attributes required from both a dairy and beef perspective e.g. growth, carcass traits, calving ease, gestation length.

From a breed perspective, anything with good growth rates, carcass performance and meat quality will be better for veal. The colour of the calf is currently still also important for easy identification as a beef calf at birth. Until we really know what the market signals are and what they will pay for then emphasis on any particular breeds doesn't matter too much yet. One genetics provider suggested we are better off starting with multiple breeds to work out what works best here and what the markets prefer, then once we have a better idea on requirements we have enough genetic diversity in breeds to be able to deliver it. Continued efforts like this will assist in the uptake of the use of beef genetics in dairy herds.

#### Sex of calf for rearing

Traditionally most veal systems internationally use bull calves.

Bull calves are likely to have better growth rates than steers or heifers. However, farmers would likely want a mix of heifers, steers and bulls depending on their farm system. There may be some benefits to farmers in having animals as steers as it gives them more flexibility in their system in terms of choice between killing the animal as veal, or holding onto it and growing it through as traditional beef. While others would prefer bulls for any growth rate advantages, and also the flexibility they offer in terms

of being readily saleable at any age. If animals were to be reared right through as veal on a dairy farm, then steers or heifers would be required to reduce the risk with cows on farm.

From a programme point of view, having a mix of sexes would help to spread the timing of when animals were ready for slaughter, although anything too slow would be a problem due to the 12-month age restriction.

The New Generation Beef project at Massey found that there was very little difference between steers and bulls up to 12 months of age in both growth and product quality. At less than 12 months the animal has not quite reached puberty so the effects seen with older bulls on meat quality are not an issue yet.

#### Timing and weights

Timing of when animals arrive and leave between systems is difficult to be prescriptive about, as all systems are very different, and it would depend on several factors. Results in a recent trial looking at meat quality had dairy-origin steers achieve average live weights of 252kg, 303kg and 348kg at eight, ten and twelve months respectively, in a free-range pasture and crop-based system. These calves were 103kg at three months of age when sourced from the rearer and had an average daily live weight gain across the three slaughter groups of 0.9kg/day. This gives a good initial indication of results that are achievable here in our systems.

Based on international systems currently, it would be likely we would need to produce around a 300kg liveweight animal or heavier, although this is rather unknown until we know our markets and what they want.

The heavier the animal, the more saleable meat product available. This is an important KPI for efficiencies, including within processing and utilising 'hook space'.

The key timing requirement is that animals need to be slaughtered prior to 12 months of age to be in the veal category.

There was a common theme in messaging that farmers are pretty adaptable and would build a system to accommodate veal if it was economic – *'It would all be solvable'*.

#### Access to capital

It was suggested that one challenge for adapting farm systems to suit a veal system would be with banks supporting this. Currently their appetite for change if risk was high and returns uncertain was very low. In contrast to this, it was also noted by more than one interviewee that both banks and private investors, investment funds etc. were increasingly focused on the triple bottom line including sustainability measures. This includes increased focus on animal welfare, and so as bobby calves become more of a concern for social sustainability then not shifting to other systems may also become a barrier to accessing capital.

##### 9.3.1 Dairy farm

For dairy farms the most critical changes required for a veal industry to work is increased use of good beef genetics across part of the herd to allow more suitable calves for a veal finishing system.

Following this point, their involvement is likely to vary farm by farm as shown in Figure 9. This would be dependent on their appetite for diversification and whether they want to stick to keeping their farm system as simple as possible or not.

For some, providing the calf could still go at four days old or close to it, then there would be little implications to their system. If there was a differential in days required on farm between dairy beef and going as a bobby calf then this would be a barrier for some.

For others, if calf rearing was required then this would require investment in further rearing facilities, more labour and cost with more milk for calves instead of in the vat (or milk powder).

Some dairy farms would be interested in rearing veal animals through to finish in their system too. Particularly if they were looking for some diversification in their system and beef finishing suited. This would require the displacement of some milking cows (lower stocking rates) but could be offset with increased performance per cow as genetics improved etc. The veal animals would be more likely to fit in their less productive areas of the milking platform (perhaps retire some of the platform if they can afford to) or on run-off blocks. For some farms that are facing pressure to reduce cow numbers anyway (e.g. environmental rules) then replacing some with small beef animals that are on-farm for less than 12 months may suit. How this impacts the farm system needs to be modelled with feed profiles. Veal will be an increase in demand in autumn when they have lower grass production (even with irrigation). It was suggested a system in which they could be shifted by the autumn elsewhere would suit many dairy farms well.

Critical success factors include reliable market options and economic returns, lack of too much complication to their systems, timing of feed demand that works, access to capital for more calf rearing infrastructure. Other changes required would include a decrease in stocking rate with dairy cows to accommodate the extra mouths (if rearing themselves), mating decisions to ensure calves suitable for rearing and end product use, possibly a change in labour requirements, and more infrastructure if rearing themselves.

#### Opportunities and benefits

The primary benefit to the system would be the reduced risk to social licence to operate with less bobby calves. If veal was reared on the dairy farm then diversification to income streams may also be of benefit, depending on the economics. However, it does need to be asked whether veal is a big enough diversification for what some might be looking for? It is still cattle farming, still have to re-grass, and are the environmental benefits enough?

Another benefit may be an increase in cash-flow during the late autumn and winter period as the veal animals are sold while high levels of cash are going out for winter grazing.

If the farm has reduced bobby calf numbers then better mental health for those working on-farm may be a significant benefit as there are many staff who do not enjoy the fate of those calves, particularly if they are required to euthanise them on-farm. People want to feel good about their work and farm businesses that can offer systems that have less bobby calves may be very attractive for some people. This would enable farms to have the ability to attract and retain good staff which should not be underestimated, particularly when finding good labour is an issue.

#### Challenges

Complications to their systems and to the skill set required. Currently their mindset and set up is all driven around milk. This would depend on management and staff skill sets and interests.

Returns that can compete with milk and reliably, because they can't easily switch between milk production and beef. Although it was commonly suggested that it may not have to be equally as good because it did add other benefits such as changing their risk profile with diversified income streams, but probably at least 75% of milk price returns would be required for it to be considered. However, there is likely to be some variation in this and how willing they are to adjust systems and reliance on milk returns depending on how leveraged they are and there are a number that would take a slight commercial disadvantage. Wider implications or benefits to the farm system would need to be worked through such as cost and labour changes.



Having multiple mobs of calves to rear may also add some complication to the infrastructure required and management e.g. bobby pens, beef pens, and replacement pens.

### 9.3.2 Calf rearer

There is a clear need for more calf rearers in the industry for a veal supply chain to work.

There were little challenges seen for calf rearers to adapt to a veal system other than likely more infrastructure and labour required to rear the increased numbers. If this were not carefully managed during the growth phase, there could be a risk to animal welfare. This investment may be a barrier for some rearers, and potentially some dairy farmers may be better placed to fund that.

The biggest hurdle noted was the need to reduce the volatility in the market to maintain calf rearers in the system. Currently the biggest volatility sits with the calf rearer due to buy and sell prices for the calf and a relatively short window for margin to be maintained. One interviewee noted they had heard a figure that 25% of rearers last only one season. With calf rearers crucial to a successful veal supply chain, pricing models that reduced the volatility in the market for calf rearers was crucial. Contract rearing where they know their fixed margin per calf is the most apparent solution for this. Many people suggested First Light Foods model with wagyu calves was a good example of a contract system that seems to be working. Many of the international veal systems work with contract rearing to reduce volatility. How can we apportion risk and reward right across the supply chain? If there is a big processor, how do we ensure that the value comes back down the supply chain to the rearer? Volatility is one of the most critical factors to solve for a veal industry in New Zealand to work.

A strong message to calf rearers is required as to what the 'play book' looks like and the expectations. What breeds are required, how do they need to be reared, what diets are required etc. Some concerns were raised by one interviewee around the quality of milk powder and how it is inferior to the quality of fresh milk. In addition, the requirements for good protocols around colostrum use would be needed and they felt like the existence of contracts from milk companies to buy the colostrum was driving the wrong message. The content of calf supplements such as pellets and mueslis were also raised as something to watch going forward.

Biosecurity is another a high-risk area for the calf rearer that needs to be able to be managed, particularly with *M. bovis*. For smaller rearers this would be easier to manage through supply from one or a limited number of dairy farms. Large calf rearers would have more risk here and quarantine processes etc. would be critical.

### 9.3.3 Finisher

There are likely several farm systems where veal animals could fit and as with all stages on-farm, there is no one-size fits all. One key requirement will be the availability of reliable high-quality feed and sufficient quantity during the summer, autumn and winter to ensure good growth rates can be maintained to reach target weights prior to 12 months of age. This may limit the locations of finishers to areas where there is reliable rainfall, irrigation, or integration of forage crops.

The important point to note is that for veal animals to be reared beyond weaning, something needs to be displaced that exists currently to enable feed availability. As previously mentioned, there may be some dairy farms that choose to rear veal animals through to finishing themselves. This may be on traditional sheep and beef, deer, mixed cropping and livestock finishing, or even dairy grazing farms.

It may fit well with intensive deer finishing systems that have deer gone by Christmas and don't buy back in until the autumn. Mixed cropping and finishing systems would be another likely option where they would fit well.

General consensus was that there were a number of existing systems that would be interested in veal finishing and it would really just need to be modelled to understand the economics and feed demand



profiles to work out where they best fit. Most thought that farmers were very adaptable with their farm systems and that if it was economic then they would make it work. One finisher said that it would easily fit into their existing system and if the market existed and requirements around weight and timing etc. were understood then they would adapt existing livestock and feeds to make it fit.

One issue for some with having veal animals is they don't allow the farm to utilise the spring flush of feed. Other animals, harvesting of feed, or cash crops would be required to integrate to deal with that. Many suggested that finishing them before the first winter would be critical for some farm systems so winter feeding was not required. One mixed cropping and finisher thought veal would suit their system very well for a number of reasons; they have irrigation, good autumn and wintering country, they wouldn't have to take as many big older cattle through the summer when it was dry or have heavy cattle on their soils in the winter, spring flush is less of an issue as that is when ground is being taken out to be put into crop, and would be very similar to winter lamb finishing for them.

Some noted that there was less risk given that at the 10-12 month age they could decide which animals to slaughter for veal and which ones could carry on in their system for traditional beef. This gave them flexibility.

Younger animals are more vulnerable to nutritional balance differences because they are putting energy into bones etc. This means care would need to be taken with this and some supplementation with macro and micronutrients may be required, particularly when feed quality was poorer.

Modelling is required for various farm finishing systems with different timing and weights of calves.

#### 9.3.4 Environmental benefits

Environmental benefits suggested that may come from a veal system include:

An increase in lighter animals replacing large heavy cattle (dairy or beef). With the primary advantage of this being the benefit of lighter animals causing less damage to the soils such as pugging. This will be of particular benefit in the winter if veal animals are slaughtered prior to winter, or the really wet part of the winter. Having fewer animals on during that part of the winter will also reduce N leaching. Younger lighter animals may also help reduce the amount of sediment erosion into waterways.

In theory, veal animals should be more efficient feed converters. Energy requirements for live weight gain increases with live weight and age (maturity) because of changes in the relative proportions of fat, protein and water per unit tissue gain (Brown, Muir & Thomson, 2016). So, feed conversion efficiency compared with older dairy-beef systems is likely to be better as younger animals are more efficient converters of feed with more utilised for growth rather than maintenance. This means younger animals will have less partitioning to urine etc. and less losses to the environment. So, there should be less wasted energy going into green house gases per animal, however this may be offset by an increase in stocking rate. Some live research is required to validate some of these numbers.

It was also suggested that dairy-origin beef has a lower carbon footprint compared to traditional beef with less greenhouse gas (GHG) emissions due to the lower maternal maintenance cost relative to production. Recent research suggests that GHG emissions were 29% lower per kg carcass weight for dairy beef animals compared to suckler-beef animals and that further integration of dairy and beef production would allow the beef sector to reduce annual GHG emissions by 22% while enabling the dairy sector to improve their social licence to operate (Selm *et al.* 2021). This is primarily due to the annual emissions from the dam being allocated across three products (meat, milk and calves) and the largest portion already allocated to milk production. Whereas beef cows produce only meat and calves, with all emissions from the dam after first mating being allocated to the calves. One interviewee noted that this may be a tricky benefit to explain and market to consumers if looking to include as a credence attribute. The level to which dairy-beef can replace traditional beef will

depend on a number of factors including desire from finishers to farm different breeds, the use of better beef genetics in the dairy industry, and the role the beef animal plays in utilising poorer pasture in our hill country and helping with pasture quality management.

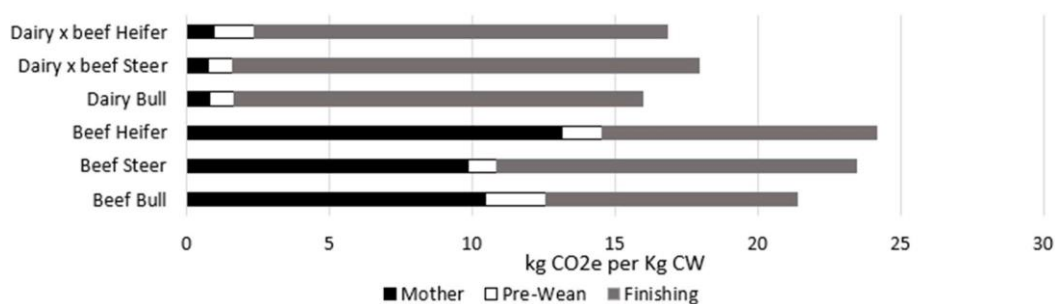


Figure 13: Greenhouse gas emissions per livestock class and per stage. Source: Selm et al. (2021) – Supplement 3

A reduction in the stocking rate of dairy cows but having cows that are higher producing would allow similar levels of production of milk but also mouths to be replaced with veal animals which are younger so more efficient feed conversion, and also less impact during winter months.

Veal might be a good mitigator option in farm environment plans for some farm systems. Again, modelling or measuring of these environmental benefits would be required.

### 9.3.5 Animal welfare benefits

There are also some animal welfare benefits with veal.

The first is the reduction of animals slaughtered in the first week of life, either being sent to the processing plant as a bobby or euthanised on-farm. This provides an extended life for surplus dairy calves. Providing that the extended life is a well-cared for animal, then this is likely agreed to be a better animal welfare outcome.

Veal animals may have less painful procedures than older dairy-beef or traditional beef. Castration may be less necessary, with bulls suitable for veal systems as they grow faster and are slaughtered prior to any effect of being a bull on the meat quality occurs. Disbudding/dehorning may also not be necessary with slaughter at a younger age, although this would be dependant on whether farmers want the flexibility to be able to carry them onto older beef if required.

### 9.3.6 Ownership, pricing and contracts etc.

Economics is the most critical component to a veal system being developed in New Zealand. One paper suggested that the meat schedule price required for the proposed enterprise to break even with traditional 24-month bull-beef was \$6.84, \$6.55 and \$5.99/kg for steers slaughtered at 8, 10 and 12 months of age respectively (Hunt, 2019). Other anecdotes during interviews suggested this needed to be around \$8-9/kg to make it viable and really 'fly' here or \$850-1000 per animal. To be competitive they needed to compete with returns from other enterprises, with an example of EBITs of \$3500/ha in Canterbury required, while another suggestion that 23 cents/kg DM is what influences the decision on what class of animals to grow. At the calf rearing point, revenue of around \$400 per calf or higher was suggested as the requirement to be economic. Returns required to make a veal system economic here need further modelling.

Recent international pricing in Figure 14 indicates that veal pricing in the 8-12-month-old category (Z) sits at a similar level other beef pricing. In comparison, Figure 15 and 16 indicate that veal less than 8 months of age is paying approximately €1/kg more than the 8-12-month category. These figures provide some international pricing context and indicate there is little difference in pricing of veal to other beef, particularly in the 8-12-month category which is where New Zealand would be likely to operate. With less meat yield from these younger animals it may mean that the economics are

challenging for veal and requires a strong focus on high growth rates and cost of rearing system. What this looks like in a pasture-based system needs to be modelled.

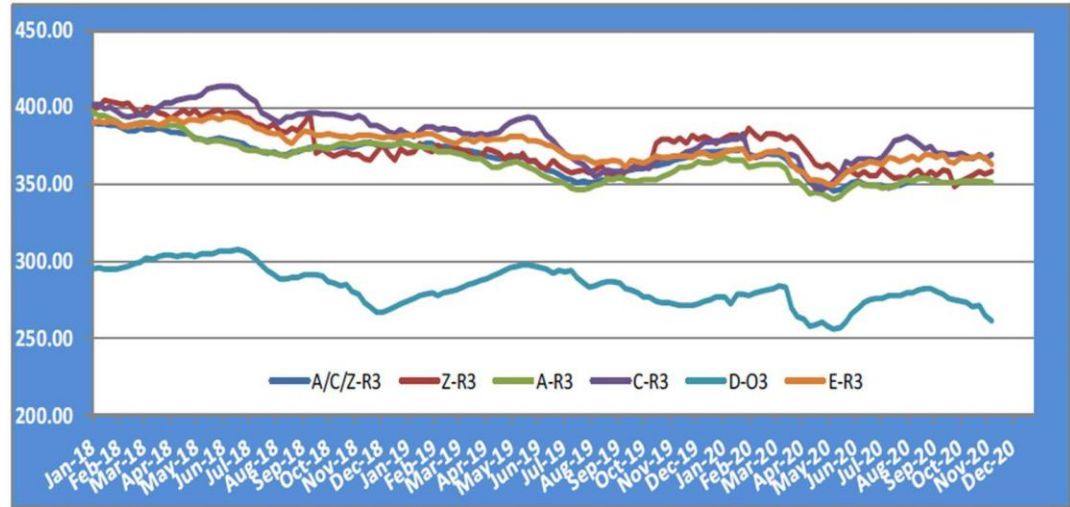


Figure 14: Pricing trends (€/100kg) for veal and beef in the EU for 2018, 2019, and 2020.. Carcass categories: A/C/Z = Young bull/Steers/Veal, Z = 8-12 month, A = Young bulls 12-24 months, C= Steers over 12 months, D = Cows, E = Heifers. Source: European Commission (2020).

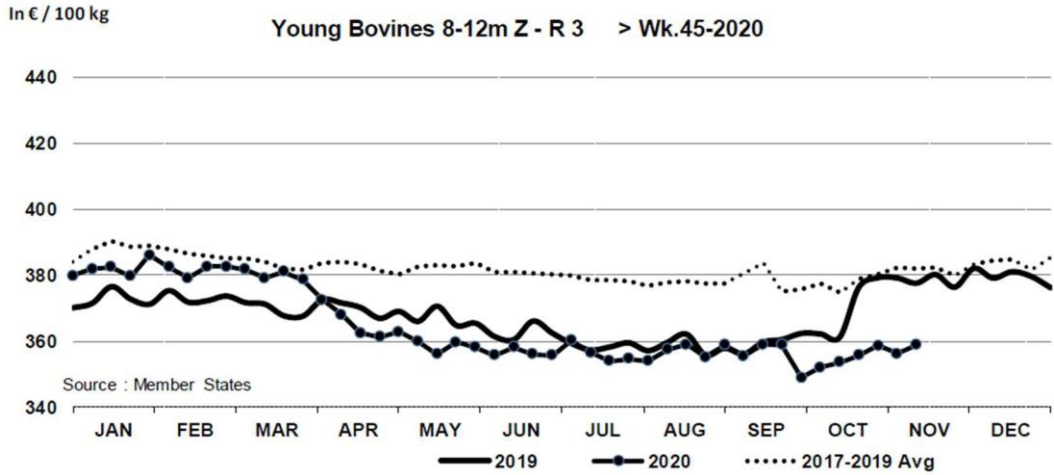


Figure 15: Pricing trends for 8-12-month-old bovine in the EU. Source: European Commission (2020).

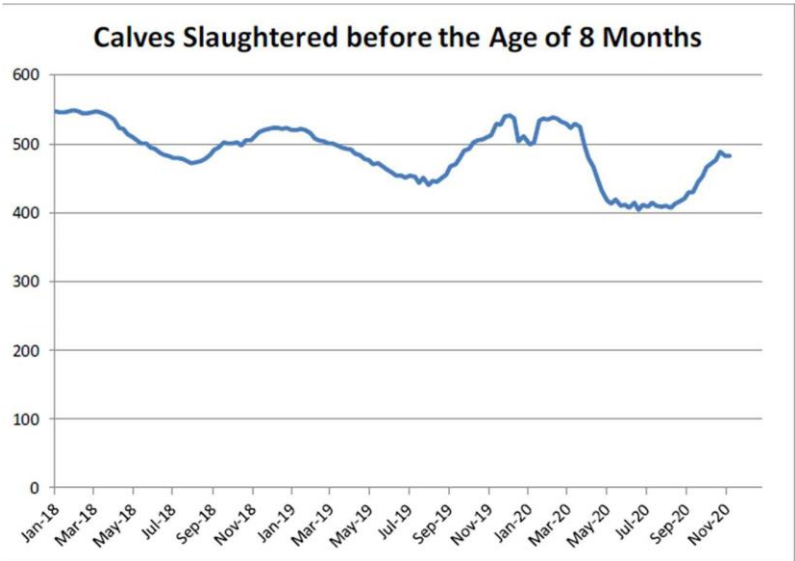


Figure 16: Pricing trends for <8-month-old bovine in the EU. Source: European Commission (2020).

Volatility in the market and returns to farmers was also a common issue raised. There is a need for a model that reduces this risk, particularly for the calf rearer. Contract rearing models was the most common method proposed with the need for relationships, integration, and collaboration key for success between breeders, calf rearers, finishers and the meat company. This is critical for the calf rearer who has the most volatility. Cash flow may also be an issue for some calf rearers so a payment system that helped with this may be of benefit. Contracts were also of more importance for finishers with a veal system than traditional beef due to the much shorter window available to make a margin. Many international systems for veal relied on rearing contracts to make the system sustainable. The First Light Food's wagyu programme model for contracting and relationships was suggested as a good domestic example that seems to be working and could be adapted to suit a veal industry here, including the role of the genetics company with the dairy farmer. Systems similar to dairy grazing were another suggestion, where someone owns the calf but pays someone else to graze it.

What the whole supply chain structure looks like also needs to be looked at as to what is likely to ensure success of a veal industry in New Zealand with different business structures and ownership models – individual companies, cooperatives, joint ventures and partnerships etc.

Further work is required with extensive modelling to understand market returns, costs and margins with processing etc., and how what this looks like at a farm gate returns level relative to cost of production.

#### 9.4 Meat Processors

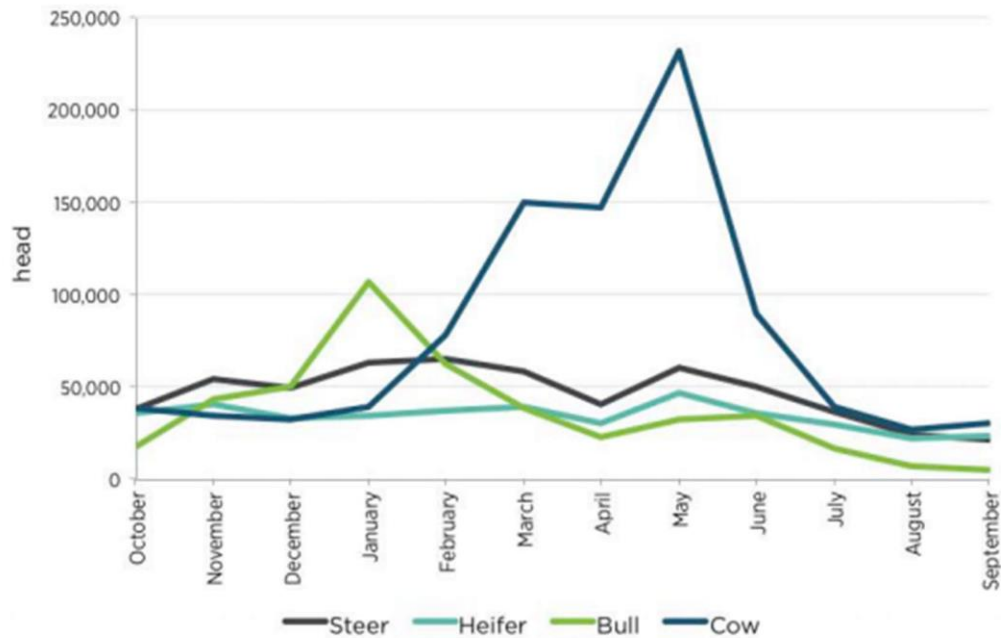
While the problem around bobby calves very much stems from the dairy industry, veal as a part solution primarily lies with the red meat industry and therefore meat processors have a significant role to play in the establishment of a veal industry in New Zealand. There were a number of views that this would likely be one of the stumbling blocks.

Many interviewees made the point that they think processing is one of the biggest hurdles we have for a veal industry in New Zealand and that we currently have very little processing capability for veal here.

This is largely based on the size of veal animals and the way in which our processing chains are designed currently. Younger veal such as the 5-6 month milk-fed veal is approximately 100kg CWT, while 10-12 month animals are likely to be closer to 150-170kg CWT. Both of these sizes are much smaller than our traditional beef and associated processing chains, and also too big for our sheep chains. The larger veal animals and their ability to be processed on our beef chains may be quite dependant on each processing plant though, with some variation in configuration throughout the country. These animals can cause a number of challenges including being too small in the stun box and so can move around too much risking ineffective or partial stunning, smaller carcasses on the chain which don't work as well with some of the structural set up and automation, and less efficiencies in terms of hook throughput and kilograms of meat processed. Size of processing runs can be another barrier, with small runs difficult to implement with the disruption caused, so support during the beginnings or growth of an industry can be limited as has been found with some previous trials looking at veal. There were issues with willingness to try something different that would likely disrupt current processing, and also problems with having processing runs of enough scale to move beyond any inconveniences. There will have been a number of animals slaughtered under the Mycoplasma bovis eradication program that were similar age and size to veal animals. So, while beef chains may not be perfect currently with their design for processing and efficiencies with veal, it is possible.

Timing may not suit with beef processing plants very well, particularly during the autumn and early winter when the cow cull is on. Late winter and early spring may be ok. It was noted by a processor that their existing customers would likely raise concerns with them if veal processing was likely to impact on or compete with processing space for existing products.

### Cattle slaughter pattern by month



**Figure 5:** Annual slaughter patterns for numbers of steers, heifers, bulls and cows slaughtered each month for the 2013-14 season. Source: Beef + Lamb New Zealand Economic Service.

Figure 17: Cattle slaughter pattern by month for 2013-14 season. (Beef + Lamb NZ, 2017).

There is a closer alignment between veal and venison carcasses with a similar length of carcass, although veal may be slightly heavier. The increased weights may cause potential issues with the stun box and also with the railing infrastructure depending on the plant.

Venison plants would need to have staff that are multi-species trained for boning and have the ability to adapt with the cuts to suit veal cut specifications. There may be some additional technical aspects we need to learn from a processing point of view here for veal carcasses, but nothing we couldn't learn from overseas processing.

The timing of when veal animals would likely be processed at anywhere between 8-12 months of age also works well with when processing at the venison plants is quieter (April-Sept, depending on calving date) so it is probable that processing capacity would be available and more suitable in our venison plants.

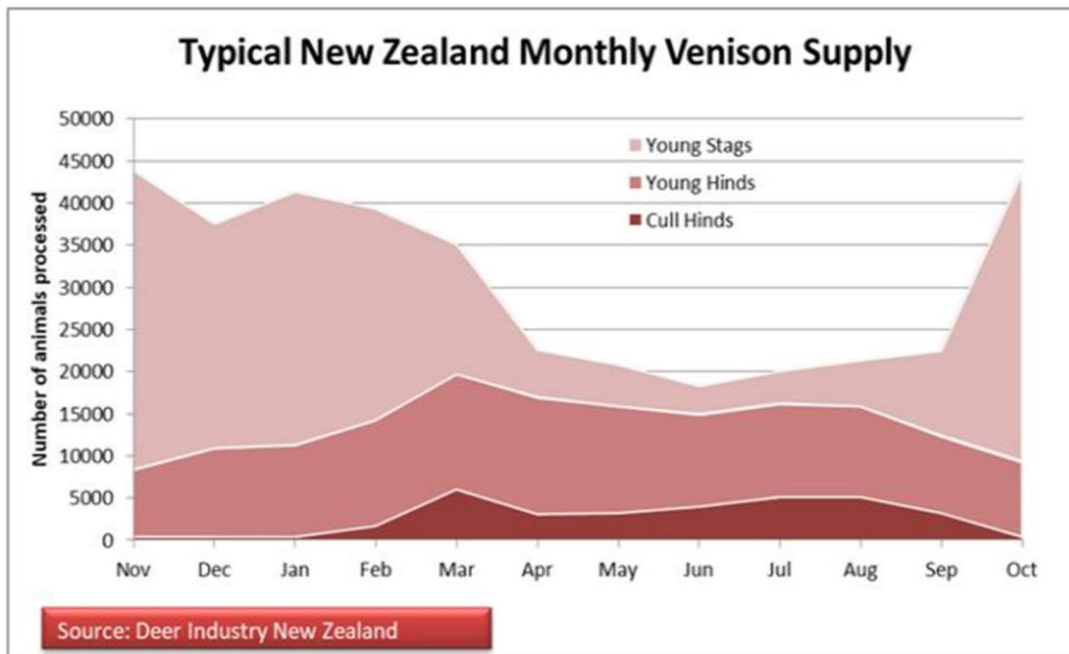


Figure 18: Typical New Zealand Monthly Venison Supply. (Deer Industry NZ, n.d.)

One processor suggested that there is a high reputational risk associated with entering into the traditional veal market and public and customer perception on this due to historic practices such as veal crates internationally may be of more risk with devaluing their existing products compared to the reputational risk that bobby calves have. However, this is likely to differ between companies dependent on their customers.

Bobby veal is currently processed on our lamb chains as they are a similar sized carcass. A benefit in this is the utilisation of this chain space in the offseason for lamb which also allows more consistent work for labour. If bobby numbers were to significantly reduce, then this would impact on the current utilisation of lamb chains.

If a veal industry along with other solutions were to grow enough to have a significant impact on bobby numbers, there would become a point when it would be no longer viable to have a bobby industry at all. Then what would happen to the percentage of calves that have no market and do need to be slaughtered as bobbies? Would it get to a point where processing plants are paid by the dairy industry to do a service and humanely slaughter the bobby calves just for rendering?

To date there has been very little undertaken in this space.

Any opportunities or benefits to meat processors largely depends on markets available and economic returns. There could be some benefits in using excess capacity, although what this looks like in the required months needs to be further looked at on a case by case basis.

Existing research found that meat processors really liked the concept of veal but thought it was high risk until processing requirements were overcome and significant reliable markets were found. This would require effort and investment into something new when they already have established products and markets. Many liked the idea of being able to produce meat from these animals and believe they would have buy-in from farmers. The most interest came from venison processors and being able to utilise those chains more during their quieter season.

If the market existed to make veal an economically viable industry in New Zealand, I believe existing beef and/or venison processors could adapt to make it work. Internationally there are multispecies



chains that can adapt, or specific veal chains. For any capital investment into these in New Zealand there would have to be significant numbers to process and a reliable long-term value proposition. This is unlikely given the excess capacity that exists in the industry and recent historic returns.

The challenge remains as to who in the processing space will put the time and investment into market research and adapting their current processing systems to fit veal animals in. There is an element of risk and who is prepared to '*stick their neck out*' and try it?

## 9.5 Dairy companies

The most valuable aspect of a veal industry to milk processors is the reduction of bobby calf numbers and therefore the improved social licence aspect.

For some milk processors, they see that a veal industry may provide some competitive advantage and allow them to create branded products that are 'low or bobby calf free' particularly to more affluent markets such as Europe and large parts of the US. There is likely less competitive advantage for these things into markets such as Asia currently. However, if it became easy to replicate this and was at significant scale then the premiums would be eroded. It was suggested that to have a true competitive advantage then you would need to be able to say zero bobby, and for it to be a competitive advantage, the market needs to understand the issue well. As previously mentioned, it is also viewed as their ability to move up the value chain into the desired markets and may not have a lot of influence on farm gate milk price. It may just be a 'ticket to the game.' It is important to put animal welfare into perspective and addressing consumer concerns may not boost sales but help stem their decline, it is about delivering the full range of benefits to consumers that they demand from food products in the twenty-first century (Hughes 1995).

For others the drive to support reduction and other solutions such as veal is based around meeting their strong company values which are driven by their shareholders. This is the reason it is something they are supportive, rather than any market demands currently (not seeing many due to milk into bulk powder that's on-sold into large markets, and their other product going largely to China who aren't concerned about this yet).

### Challenges/implications

Reduction is not enough to create a competitive advantage e.g. halving bobby calf numbers still means we have a million calves slaughtered at a young age and it is difficult to tell a good story around this. While there was agreement that there could be a competitive advantage for some members in the value chain to be able to market themselves as 'bobby calf free', it was well recognised that until the whole industry could tell a good story on low or no bobby calves, that there was high risk to other members in the market or the industry image as a whole. Care would be required with promoting dairy products based on reduced bobby numbers due to a veal industry to ensure that it didn't negatively impact the business or industry elsewhere. One processor suggested that this was possible to achieve if you are aware of it when making your campaign and ensure you are focussing on the good things you are doing and not on the bad things others are doing.

On the surface of it, a veal industry may seem like it could have a negative impact on milk processors with both milk and dairy land going to beef calves instead. This may be the case if processors are focused entirely on milk in the vat and if they don't have the ability to acquire milk from other processors. However it was pointed out if you took a much wider view then this was a positive with less milk being better for the environment, overall better sustainability for the farms, improved labour issues with having less cows and some beef too, and less wintering of cows. For those that add more value to milk and typically need less of it, then they wouldn't be so concerned. Furthermore, if they were attractive as a processor then they could replace the lost milk from a farm by adding more suppliers to their business. Another processor indicated they weren't 'empire driven' and loss of some

milk supply and some increased costs wouldn't be a big impact or driver for them. At a national level, yes it would impact total milk supply, but hopefully this would be outweighed by the ability to export to desired markets.

There are also some potential negative outcomes from rearing more calves if the rearing industry is not well equipped for it with good facilities and labour. The industry would need to make sure that we have good systems in place to rear more calves or there would be the opportunity for more negative publicity with poor animal welfare which is a big risk.

## 9.6 Markets

What markets exist for a New Zealand veal product is still relatively unknown and significant effort into market research is required. The question is, who will do this? To date there doesn't appear to have been any significant effort into this from anyone.

There was a strong message that marketing is the key to the success of a veal industry here, and good marketing stories often mean a lot more to success than the truth and facts i.e. 'the right amount of nothing'. This requires strong investment. One example given was the success with Australian beef marketing and the perception from many international consumers that it was better than New Zealand beef, with this success largely due to the level of investment put into marketing by MLA. One view was that market research needed to be the role of Beef + Lamb NZ rather than sales and marketing teams at a particular processor.

Logistics is another issue raised with getting product to market, particularly during early growth stages when volume was a problem and had significant impact on cost.

We need to have confidence to put effort into creating the markets for this unique New Zealand offering, and not just wait for the illusive consumer to tell us what they might want. Collaboration between all players to come up with an informed offering that can work for us is key and then some effort into finding and creating the markets for it. The world can't feed itself by 2050, so markets will be there. A lack of confidence as a country was noted as one issue, and the 'chicken and the egg' issue with supply and markets really doesn't help this.

There is a need to decide what the positioning of the product is and what we want to compare it to. Are we competing with the beef category?

### Co-products

Co-products are an important part of the carcass to remember and market research into these is also required. This is not an area I asked people about with interviews, although one did mention that there is some research happening in this space in New Zealand, particularly with the hides, to look at what properties these have to offer including aspects such as less faults because they are young, improved elasticity, and collagen content and quality. Offal may have some benefits to offer with the younger age compared to beef with better palatability and less build-up of toxins. There may be opportunities in the petfood space for these too, although it is a competitive market.

### The name 'veal' – branding, meat classification and accreditation

One challenge is what we want to call our product. As previously mentioned, there are strong views around the word 'veal'. In some markets, particularly parts of Europe, it is a part of their cuisine and often considered a premium product. For many others, the word veal is tarnished due to their perception that all veal is still produced like it was historically – in small crates in the dark with very restricted diets. They immediately think of negative animal welfare practices with veal. There is a third segment that only associate the word veal with bobby calf veal and many have a negative perception on this practice too. A final category don't really know what veal is or how it is produced.



A recent paper in the UK looked at public opinion and perception of rose veal. Most respondents (66%) did not eat rosé veal, mainly due to limited availability or exposure (31%) and animal welfare concerns (17%). A third of respondents knew the differences between rosé and white veal. After defining this, 61% of respondents would eat rosé veal, compared to 23% of respondents who ate it beforehand. Most respondents (91%) were willing to pay more for rosé veal burgers than the proposed average price for beef burgers. Increasing availability is key to encourage the sustainability of rosé veal production in the UK (Skelhorn *et al.* 2020).

There was a strong theme with responses in the UK research that those with moderate or limited livestock farming knowledge had little awareness of the differences between rose veal and white veal. This is likely to be the case here in NZ too.

New Zealand needs to gain a similar understanding on this both domestically and with possible international markets. Results will help us to understand demand, the marketing and branding stories required, and what consumer education is needed.

With inconsistencies internationally as to what different veal categories mean in relation to weights, age, feed and rearing conditions, it makes it difficult to classify what name/category New Zealand should adopt. Just about all of the interviewees for my research were of the view that New Zealand needed to come up with a new name for what we could produce rather than calling it veal. While the term 'rose veal' does help move away from the history of traditional milk-fed veal, this category is still primarily produced in housed systems with mixed rations. Everyone felt we needed a new term to market the New Zealand method of veal with pasture-fed and free-range to avoid confusion. This is all about branding. Some did note that care would be taken to ensure consumers did not feel like they were being misled. Both kiwifruit as a new product name and Zespri as a brand were given as examples for what veal needs to follow in New Zealand, also suggested as successful examples were the use of SILERE with merino, and Cervena with venison.

While this is relatively easy from a branding perspective, investigation is necessary into what this means at a processing point and the associated meat classification regulations. Overseas market access requirements (OMARs) outline the requirements that exporters need to meet to access markets in different countries. The requirements differ, depending on the country and commodity (MPI, 2020). This is something that will need to be taken into consideration when deciding what meat classification is being used. Can an animal under 12 months be classified as both beef and veal? In Australia, AusMeat have created a completely new category for rose veal to deal with the product now produced by Torello Rose Veal. This is an accreditation program (quality assurance) in order to be able to clearly demonstrate that it is operating in accordance with the requirements and expectations of consumers, markets, regulatory authorities and the wider community in relation to the key issues of animal welfare, environment, meat quality and food safety (Aus-Meat, n.d.)

There are a number of accreditation schemes that exist internationally relating to calf welfare. New Zealand would need to look at whether they adopt any of these recognised accreditations, create our own, or a combination of both.

#### 9.6.1 Domestic

To gain supermarket access in New Zealand for a new product then a case needs to be put forward which includes consumer insights and what the opportunity is for the item. This consumer insights piece needs to be completed domestically. There is also increasing difficulty in attracting consumers to new products, and in general we are seeing a reduction in consumption of meat so this category is difficult.

Currently retail saw little risk with bobby calves and their dairy products on shelf, largely due to lack of awareness domestically of what actually occurs in our farming systems. While there could be some

competitive advantages to be had, it was noted the risk was very high and you had to be very careful 'putting your hand up' on issues like this.

One major barrier domestically is consumers' lack of understanding of the product veal, what it is and also how to cook it. Those that do know what veal is either associate it with 4-day old bobby veal or international veal that they think is very white and raised under cruel conditions. There would be significant education required domestically to increase consumption and demand of veal here. One UK paper did note that lack of availability and opportunity was the primary reason respondents did not eat rose veal and suggested there was an opportunity for the retail industry to improve uptake by increasing availability. Choice and availability often create a need from something with time (Skelhorn *et al.* 2020).

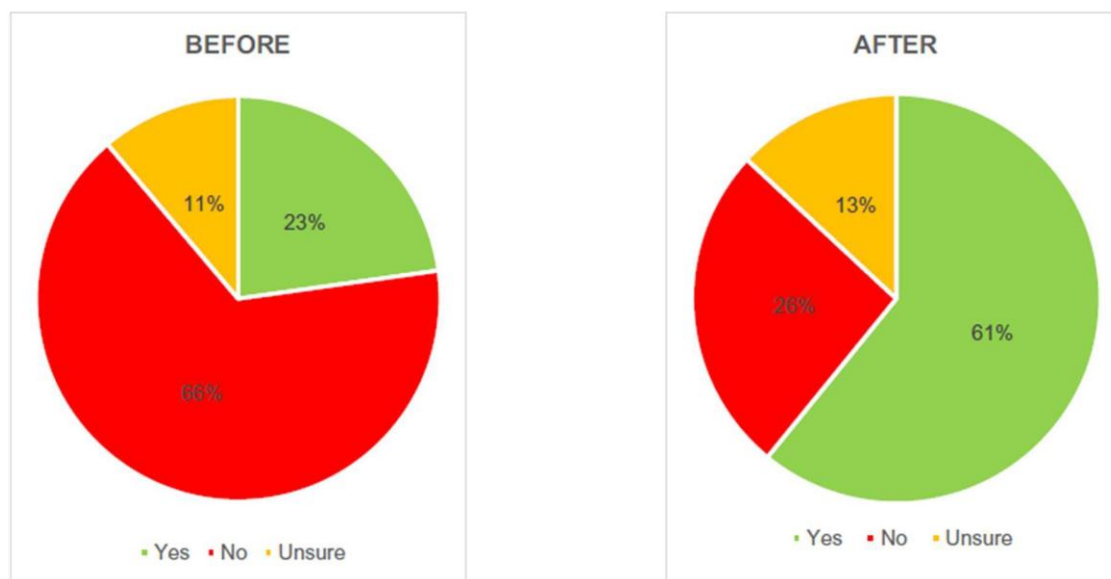


Figure 19: Stance on eating rose veal before and after explaining the differences between rose and white veal, based on the questions "Do you eat rose veal meat?" (BEFORE) and "Considering the information provided, would you eat rose veal meat?" (AFTER). Source: Skelhorn *et al.* (2020)

Consumer education and branding is likely critical. The New Generation Beef project found during their taste test trials that there are some of the older generation here who understand what veal is and can remember eating it historically, and didn't appear to have any problems with it. However, there are also many people who don't know what it is or how to cook it. Results indicated in this UK study suggest New Zealand needs to be able to tell the good story around how we would produce veal here to increase demand. While some of this could be solved with good branding, this is very difficult in the New Zealand retail space. One retail-based interviewee noted that they do not like any branded meat on the shelf as it allows the brands to start controlling their meat case. One exception to this is if there is a strong local provenance story, they are looking for some more of these. Although it was noted that while a local provenance story would likely increase demand for your product, you can't expect consumers to pay much more for it. Other credence attributes such as grass-fed and free-range were of little benefit domestically as that is what consumers know and expect already. If there were significant nutritional benefits such as the leanness of the product, then these would help with demand. Significant consumer education is likely required domestically, how this is achieved in the retail space without the ability to be branded is a question. One suggestion for domestic education was to use pre-prepared meal services to help secure its place in local cuisine, with options like My Food Bag or Hello Fresh to help promote the product and learn how to cook it.

An additional point made by one interviewee, was the requirement for education with the consumer on the fact that intramuscular fat content was not required with this product in relation to achieving tenderness attributes, as the young age of the animal meant it was already very tender.

From a retail perspective, the offering would have to be fresh, unless it was in some sort of food to go/ready meal form. It was suggested that veal would need to do something in this space as there is growing demand for products that provide convenience and inspiration while still allowing the purchaser to have some role in the cooking process.

Seasonality may be a limitation. The requirement for fresh product does cause some limitations with veal in the retail space domestically as it is very unlikely to be able to get a year round supply due to the maximum age limit but also the time taken for them to grow large enough – this leaves quite a short period for slaughter. A ‘best in season’ approach may be required. Some seasonal offerings do work and are considered, but it is important to market on why they are seasonal and to maintain a short season to build ‘hype’ around the product. If this was stretched too far into the shoulders of the season, then it loses its appeal. This is something veal could consider both domestically and internationally.

In general, New Zealand retail tends to deal only with the bigger suppliers for meat to ensure consistency of supply and price. This makes it more difficult for any smaller players to start the journey in the veal space.

Domestically there are some chefs that are definitely looking for new products to put on their menus and veal with a good ethical story around it would appeal, but is hard to find (Heaton, 2017). Again, some consumer insights work is required to know what level of demand there may be, along with good branding stories and consumer education. One challenge with food service will be seasonality and whether they will accept both fresh and frozen product or consider a menu item that is seasonal.

#### 9.6.2 International

There are significant veal markets that exist internationally, primarily in Europe and the US. Much of this is for traditional milk-fed veal though and interviewees suggested we shouldn’t be trying to compete with this market and would likely be considered a second-tier product, even if we had a better welfare story.

There appears to be very little grass-fed free-range veal on the market which is the space New Zealand would be likely operating in, so there needs to be significant market research completed in this space to understand where the best market opportunities are. Many have suggested Asian countries are likely to be interested and should be a focus for New Zealand, anywhere that is becoming more westernised.

Two interviewees suggested that America is where all the consumer signals we are driving to achieve are coming from (e.g. premiums for grass-fed) so there are likely opportunities there. One customer spoken to in America did note that there would be challenges there around veal due to the negative history associated with it there. An example was given of one American fast-food restaurant chain that stopped the sale of all products containing veal after a video of a calf on a truck that compromised animal welfare. Millions of dollars of product on-hand was sold at a loss. This decision was made due to social pressures. Strong marketing with taglines such as grass-fed, free-range and never-ever/antibiotic free would be required to gain any traction there. He also raised the issue of veal being an issue with retail patties due to the colour of the meat being too light, but not so much of an issue with IQF (individually quick frozen) patties because they are white anyway. Whether colour is as much of an issue with veal raised in pasture-based systems to older ages as New Zealand would is something that needs to be investigated further. The Massey research project suggested that the meat was still quite red. A large percentage of dairy-beef here is currently raised for bull beef and sent to America.

One customer suggested that the large volume they purchased from us gave them some ability to influence choices here and that there would likely be pressure on meat companies here to finish the animals properly rather than young as veal, as they need a lot more beef from us and have been telling us for years to utilise bobby calves more. While this is fine in theory, it is not possible in practice due to insufficient feed to rear them all as older bull beef. So, whether this pressure would have any influence on outcomes is another question.

Again, the seasonality of the offering would be a challenge and finding a frozen market option would be important to help solve this, or the ability to offer a 'best in season' programme.

Similar issues mentioned domestically around consumer awareness of what the product is, how it is produced and how to cook it would also be required for international markets that are new to veal, or to change perceptions from historical or international production methods to what we do here. Some reports indicated *that publicity about the availability of 'welfare veal' has led to sales increases in the past, with one of the top four UK supermarkets, reporting that following publicity on the cruelty of veal crates and the availability of high welfare British veal in their stores "sales of veal increased by 30 per cent". In the UK, Marks and Spencer reports that although veal is very much a niche product, demand had increased. "This is attributable to an increased interest in Italian food but also because of the improved welfare standard for calves reared for veal". In Denmark annual consumption of veal increased to 2kg (4.4lb) per head from a low of 0.5kg (1.1lb) following development of light red veal from group-housed calves fed with milk and roughage. Moreover, a 1995 Gallup public opinion poll revealed that 64 per cent of French and 45 per cent of Italians were prepared to pay 10 to 15 percent more for humanely produced veal. For many consumers, the veal crate ban may be said to have improved the veal industry's image (McKenna. 2001).*

One company interviewed in Ireland who had a rose veal offering have been significantly affected by Covid19 and restaurant closures so have decided to stop producing veal. This was a one farm operation. Finding restaurants to take the top cuts was easy and they couldn't keep up with demand. The critical success factors highlighted included; the need for a branded product to get premiums, getting enough scale to be economic with small margins, finding a price point for mince that helps with overall carcass price, developing a product similar to the Dutch croquette to put the low price cuts into – they are your supply 'controller', and the ability to have a frozen business as well to help with seasonality. The current state of the market, particularly post Covid19 needs to be thoroughly researched.

### 9.7 When are we likely to see any change?

A couple of milk processors suggested they we would likely see something from them on a small scale in the next 3-4 years that would support change with reducing bobby calf numbers, while another thought we could probably expect some movement and soft changes/guidance from industry (not legislation) in the next couple of years. It is likely that changes will come internally from social decisions before market pressure and until there was any large-scale national solutions to reduction of bobby then there wouldn't be any regulation. If nothing happens at a customer or market access level, then some believe it may be another decade before we see anything major at a whole industry level.

There are a couple of activities starting to happen that were mentioned during my interviews. One at an industry wide level to focus on early-life slaughter of calves, the risks and solutions for reducing. There is another project of scale with some farms and industry players being initiated to focus on young beef. It was expected that it would take 3-5 years to see impact on-farm from this and have processes we can follow and wouldn't happen at big scale quickly, perhaps 50,000 animals in 3-5 years.

There is certainly growing interest currently in this space as industry searches for a range of solutions.

## 10 Conclusions

New Zealand has a growing industry issue relating to the early slaughter of surplus dairy calves and the risk this poses to our social licence to operate. This pressure is coming from both customers and market access, as well as general public social pressures. It is generally accepted at an industry level that in time one or both will reach a point that causes problems to our industry's ability to operate as it is currently. While public and consumer awareness of current industry practices was not at a level high enough to require change yet, it is well understood that this will increase with time so we must be proactive in finding solutions now that we can implement in the future before change is forced upon us.

A veal industry in New Zealand has the potential to be one avenue help reduce the number of surplus dairy calves slaughtered at a young age here.

There are a range of benefits and opportunities including:

### On-farm

- A reduction in the number of surplus calves that are slaughtered at an early age and therefore wastage.
- An opportunity to further utilise this existing natural resource.
- Better availability of good beef genetics to use in part of the dairy herd for calves that are more suitable for veal
- Diversification to farm system with possible benefits including improving risk profile, cashflow timing, staff enjoyment
- Improved mental wellbeing for farmers and therefore ability to attract and retain good staff
- Improved triple bottom line reporting for access to capital and improving margin rates on interest
- Environmental benefits with younger, lighter and more feed efficient animals
- A good farm system fit with some existing enterprises e.g. cropping

### Industry & market

- Reduced risk to social licence to operate
- Maintain or improve access to customers and markets, potentially with some competitive advantages
- Further utilisation of existing meat processing plants including venison chains
- A differentiated veal product with credence attributes NZ has to offer e.g. grass-fed, free-range, GMO free, ABF free, hormone free
- Addition of another healthy and nutritious red meat to the New Zealand protein offering for the international customers
- Generate additional revenue for the country through incremental exports

However, there are significant challenges and barriers that need to be overcome to ensure a successful and sustainable veal industry here:

### On-farm

- The impact it may have on number of dairy cows and milk supply, and hence dairy farm revenue
- How to increase the uptake of use of good beef genetics in the dairy herd to ensure suitable calves – higher costs and labour requirements with artificial breeding
- Desire for diversification to system versus simplicity and the skills sets required
- Developing suitable integrated farm systems that work here for veal including fit with the pasture growth curve

- Growing animals big enough cost-effectively in a pasture-based system before 12 months of age
- Having adequate and appropriate land available to finish numbers to get sufficient scale. What will they displace?
- Requirement for more infrastructure and labour to rear calves
- How to reduce volatility in pricing for rearers and finishers – development of sustainable ownership and pricing models
- Appetite from banks for uptake of a farm enterprise that may be considered risky until returns are well understood and effect this may have on capital access required and cost of that capital
- Biosecurity risks such as M. bovis compared with closed beef systems

#### Industry & market

- Finding and developing suitable markets for a premium and differentiated New Zealand veal offering that generate returns to make the system economic. This challenge will likely be enhanced while Covid19 restricts our ability to travel.
- Processing capacity and capability that suits the size of veal animals, efficiencies, as well as appetite of meat processors to adapt and enter the market
- Seasonality of the product and the complications this brings with meeting market demand
- Challenge to have branded product on New Zealand retail meat shelves resulting in inability to differentiate and educate consumers on the product.
- Utilising all the carcass cuts and co-products
- How to promote a veal industry without creating increased awareness of animals that are still slaughtered at a young age
- The negative connotations that exist with the history of veal and deciding how to position and market our veal to the world
- Both domestic and international consumer education on what our veal is, how we produce it, and how to cook it to get increased demand for the product.

Getting any progress or change will come down to the level of effective industry collaboration that takes place between dairy and beef, and who is prepared to take some risk and ‘stick their neck out’ to have a go. Following interviews for this project, it appears there is movement starting to happen at both levels and it is likely we can expect to see some change in the near future. While there are significant challenges to overcome, I think we are likely to see innovation within the industry and a veal supply chain developed in New Zealand in the future. This is primarily due to the need to do so to help avoid the potential catastrophic impacts that no change to early slaughter of calves may have on our whole industry.

## 11 Recommendations

The establishment of a veal industry in New Zealand has significant potential as an industry on its own, but also has potential in protecting the social licence to operate of our dairy industry. However, there are number of complex issues to navigate through to achieve this. My recommendations for next steps that need to occur are as follows:

#### On-farm

- Undertake comprehensive modelling of the farm systems (dairy, rearing, and finishing) including the economics, infrastructure and labour, capital requirements, and feed profiles.
- Establish small scale trials to test the various farm systems for breeding and rearing suitable veal animals including different farm enterprises and rearing protocols.

## Industry & market

- Establish collaborative leadership and activity between all industry and supply chain partners to further develop this potential industry
- Model the whole veal value chain to understand the economics for each chain participant from dairy farmer, to rearer, to finisher to processor.
- Develop ownership, pricing and contract structures/options to ensure sustainability of all participants and in particular, reduce volatility to rearers and finishers
- Undertake both domestic and international market research including consumer insights studies to understand the best positioning and marketing opportunities for our veal and the credence attributes desired. This could occur both at an industry level (e.g. Beef + Lamb NZ) and by individual commercial companies.
- Decide how we should name and brand veal in New Zealand to avoid the negative connotations that exist from historic practices internationally – this could come from a collaborative effort across companies or an individual company.
- Work with meat processors to ensure processing capability and capacity exists
- Determine product specification requirements for different markets to develop carcass cut mix at processing.
- Research and development into opportunities for further product development to achieve better carcass utilisation and of co-products.
- Undertake robust research into the environmental benefits and challenges of veal including GHG, water and land management implications
- Establish some supply chain trials - a small group of farmers and industry partners who are willing and able to take risk to develop and produce a product that buyers want, in sufficient quantity to both test and begin to develop markets and supply chain processes. This will help provide confidence for commercial entities to start activity at scale.
- Secure industry good funding (e.g. Sustainable Food & Fibre Futures, AGMARDT) to help support research and development at farm, processing, and market levels.

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