



Mortality rates in young calves in the 2018 and 2019 spring calving seasons

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Executive summary

This report details the calf mortality rates at slaughter premises during the 2018 and 2019 spring calving seasons. For the third and fourth consecutive season, combined industry and MPI-led initiatives have resulted in further reductions in calf mortality rates, with the lowest level to date reported in 2019 with 789 calves dead or euthanised from approximately 1.77 million processed (0.04%).

Young calves (also known as bobby calves) are vulnerable animals. The New Zealand dairy industry produces more calves than can be absorbed by the dairy sector as replacements, or by the beef sector for rearing. Surplus calves are often transported and slaughtered for meat and other animal products from 4 days of age.

Since 2008 MPI veterinarians at processing premises have recorded mortality rates of young calves as the best current proxy for young calf welfare. Mortality rates are calculated from the number of calves dying, or being euthanised for welfare reasons (referred to as condemnation), during transport to, upon arrival, and in lairage¹ at processing premises.

A joint work programme between the Ministry for Primary Industries (MPI) and industry groups operates to promote best practice and high welfare standards for young calves. Up to 2016, work was largely based around education and voluntary compliance using the minimum standards in the codes of welfare. In 2016 and 2017 regulations were introduced under the Animal Welfare Act 1999 that contained penalties for breaches. A number of on-going programmes were initiated by MPI to monitor the impact of and compliance with these regulations.

The commitment of people across the entire supply chain to both communicate and implement good animal welfare practices, supported by clear regulations, has resulted in a substantive improvement in the welfare of calves since 2008.

This report details the results of the 2018 and 2019 seasons.

¹ Areas for holding livestock prior to slaughter.

1 Background

Ensuring high standards of welfare for calves is recognised as a priority and at the heart of good farming practices. It is the collective responsibility of both MPI and industry.

Surplus young calves in the dairy industry (commonly called bobby calves) are typically transported and slaughtered for meat from 4 days of age. The welfare of these calves is measured through the number of calves that die or are condemned due to welfare reasons upon arrival, or prior to slaughter, at processing premises. This number is referred to throughout this report as the mortality rate, and unless otherwise stated, relates to calves processed for human consumption purposes (referred to as meat processing premises), rather than petfood (referred to as petfood processors).

Typically around 95% of bobby calves that are slaughtered are processed at meat processing premises, with the remainder at petfood processors. The numbers in this report refer only to calves processed in the spring calving seasons. It does not include the small number of calves processed in the autumn season as the bulk of all young calves are born and processed between June and November.

1.1 INDUSTRY BOBBY CALF WELFARE IMPROVEMENT PROGRAMME

Initiatives to improve bobby calf welfare began with the Bobby Calf Transport Forum in 2008, and have since evolved to include the Farm to Processor Animal Welfare Forum, the MPI Safeguarding Programme, the Bobby Calf Action Group and the Bobby Calf Working Group.

MPI has collected mortality data at meat processing premises since 2008 to measure the improvements in calf welfare across the supply chain, year by year. The overall mortality rate includes all calves that fall into the following four categories: dead on arrival (DOA), condemned on arrival (COA), dead in yards (DIY) or condemned in yards (CIY).

Although only a proxy measure of calf welfare, the consistent recording of the mortality data allows the large scale trends to be tracked. MPI has been supporting operational research into more sophisticated measures of calf welfare, addressed later in this report. At present, however, the mortality rate of calves in transport to, or in lairage at, meat processing premises is the primary proxy measure of calf welfare used.

For more detail on the actions MPI and industry groups undertook prior to the 2018 spring calving season, refer to the reports titled *Mortality rates in bobby calves 2008 to 2016* and *Mortality rates in bobby calves 2017* at www.mpi.govt.nz/calves.

1.2 REGULATIONS DEVELOPMENT

The care and welfare of young calves is covered by the Animal Welfare Act 1999 (the Act) and relevant codes of welfare. Codes of welfare contain minimum standards pertaining to young calves but these are not directly enforceable. However, in 2015 the Act was amended to provide the ability to create directly enforceable regulations for low to medium level offending.

MPI created the first suite of directly enforceable regulations under the Act in 2016; the Animal Welfare (Calves) Regulations 2016. These calf regulations were designed to complement the codes of welfare, education programmes, supply chain system improvements, workshops and awareness campaigns that were already contributing to improved calf welfare.

The four calf regulations that took effect on 1 August 2016 were:

- Blunt Force Trauma;
- Fitness for Transport;
- Maximum Duration of Transport; and
- Transport Across the Cook Strait.

The three remaining regulations took effect in February and August 2017 and included:

- Loading and Unloading Facilities;
- Shelter Requirements; and
- Maximum Time off Feed.

The regulations introduced an infringement and lower-level prosecution framework to drive behaviour change.

The majority of the calf regulations apply to young calves (defined as a bovine up to 14 days old that has been separated from its mother), with the exception of the prohibition on killing a calf using blunt force, which applies to any calf.

You can view the full detail of the Animal Welfare (Calves) Regulations 2016 and 2017, now incorporated into the Animal Welfare (Care and Procedures) Regulations 2018, on the New Zealand legislation website or on the MPI website at www.mpi.govt.nz/calves.

2 Impact of industry action and regulations on bobby calf mortality in previous years

Between 2008 and 2015, mortality rates dropped from 0.68% to 0.25% in response to the industry's bobby calf welfare improvement programme.

With the help of new regulations, calf mortality rates declined further. At the close of the 2016 spring calving season the mortality rate of young calves had reduced to 0.12%, with a further reduction to 0.06% by the close of the 2017 spring calving season.

2.1.1 Post-mortem findings 2016 and 2017

During the 2016 and 2017 seasons, a post-mortem assessment was undertaken for the majority of calves that were dead on arrival, dead in lairage, condemned on arrival and condemned in lairage, to determine the prevailing reasons for condemnation and most common underlying signs of disease/defect.

Post-mortem assessments were conducted for 2192 calves in 2016 and 999 calves in 2017. The majority of assessed calves were condemned on arrival and in yards, rather than found dead (Table 1). The 2017 figures show that the majority of calves were condemned on arrival (55.35%), whereas in 2016 the majority of calves were condemned in yards (42.77%).

Table 1: Classification of calves with post-mortem assessments for 2016 and 2017

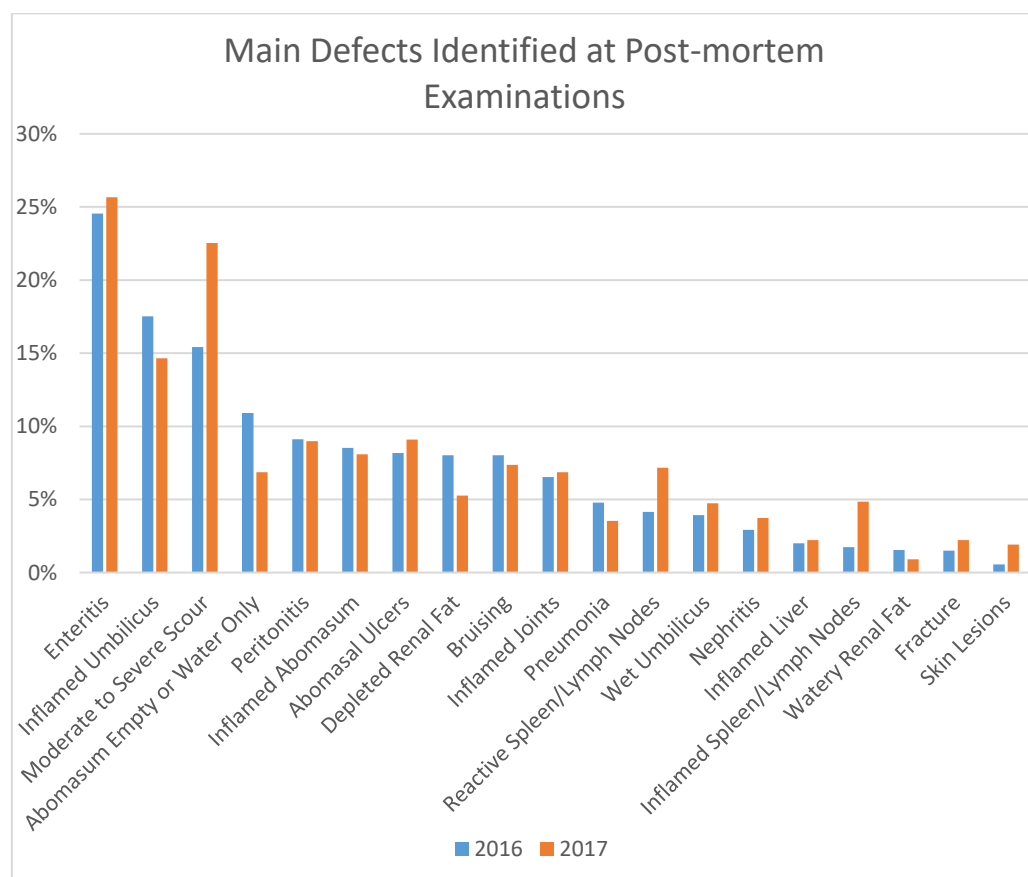
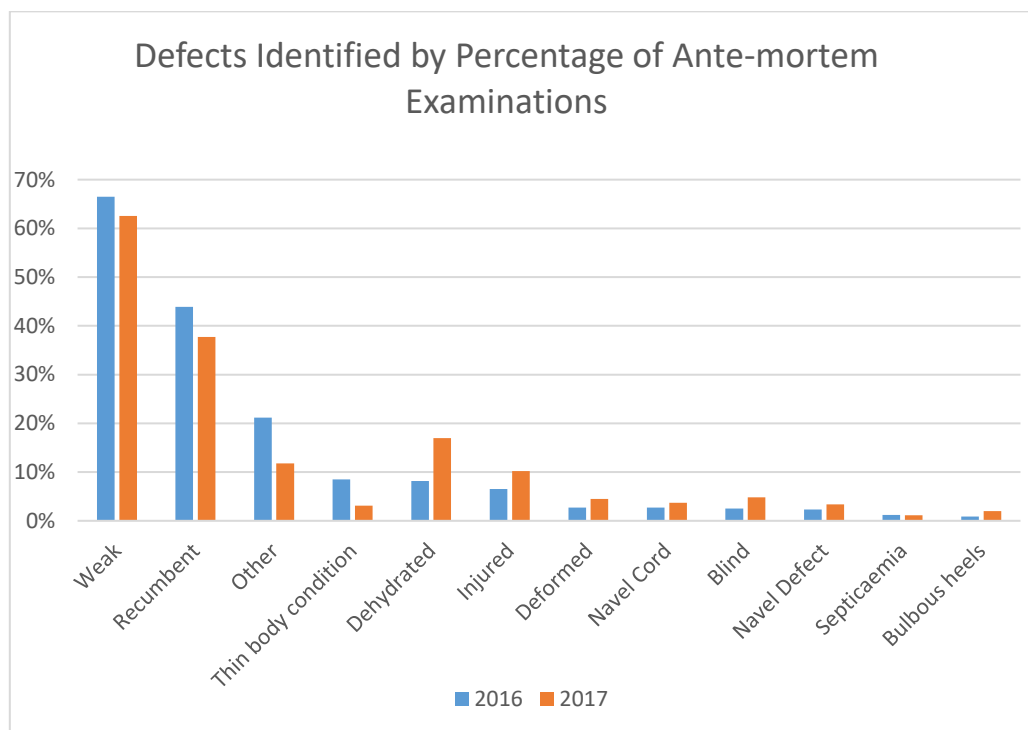
Season	2016	2017
Classification	Number of calves	Number of calves
CIY	935 (42.77%)	270 (27.27%)
COA	809 (37.01%)	548 (55.35%)
DIY	377 (17.25%)	119 (12.02%)
DOA	65 (2.97%)	53 (5.35%)
Total*	2186	990

** In 2016 one calf was sent for emergency slaughter, and 5 cases did not record a classification. In 2017, 9 cases did not record a classification.*

Travel and lairage times for calves with post-mortem assessments have been recorded. Average travel time decreased slightly in 2017 compared to 2016. On average, calves were transported a little over 5 hours. However, three recorded cases exceeded the regulated maximum 12-hour transport duration. Average lairage time decreased by about 4hrs in 2017, with calves held in lairage on

average for just under 10hrs, with a recorded minimum lairage time of 5min and a maximum of 24hrs 45min.

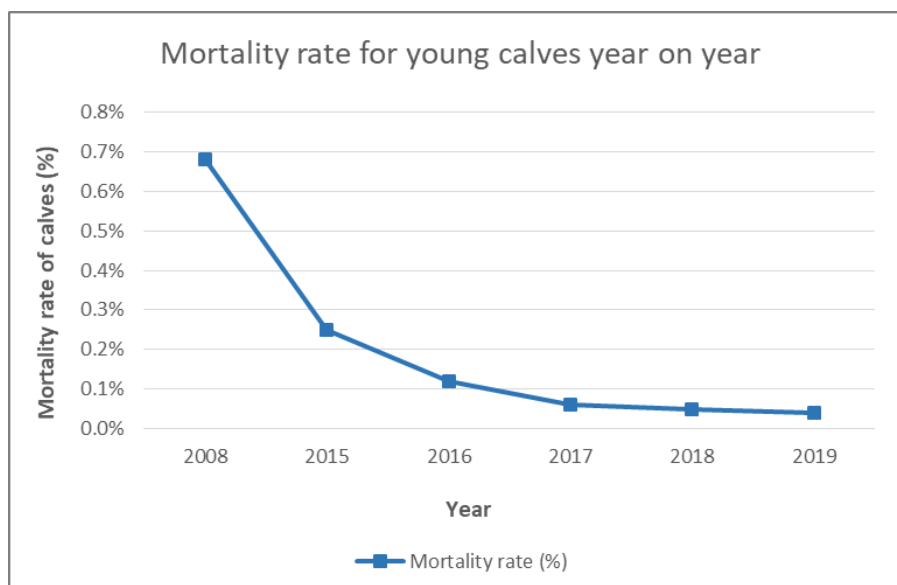
The below graphs highlight the percentage of diseases/defects identified at condemnation at arrival and in yards (top) and of diseases/defects identified at autopsy (bottom).



3 Mortality rates for the spring seasons 2018 and 2019

3.1 MORTALITY AT MEAT PROCESSING PREMISES FOR HUMAN CONSUMPTION

Data on mortality rates has been collected since 2008, reaching its lowest level of 0.04% in 2019 (918 calves of approximately 1.77 million processed) (see below graph and Table 2).



Of the young calves that were processed for human consumption, approximately 1,783,125 and 1,771,639 were processed at meat processing premises in 2018 and 2019, respectively. An additional 40,082 calves were processed for pet food in 2018 and 44,191 calves in 2019.

Table 2: Calves processed at meat processing premises

Season	2008	2015	2016	2017	2018	2019
Total number of calves	1,515,189	2,171,995	1,935,054	1,773,809	1,783,125	1,771,639
Mortality rate	0.68%	0.25%	0.12%	0.06%	0.05%	0.04%
Number of calves dead/ condemned prior to slaughter	10,275	5,390	2,255	1,123	918	789
Number of calves dead/ condemned per 10,000 calves	68	25	12	6	5	4

Across the 28 individual premises processing young calves, mortality rates ranged from 0.01% to 0.19% in 2018 and from 0.01% to 0.18% in 2019. Only four of these premises were processing at mortality rates higher than 0.10% in 2018 and only two in 2019, meaning that 24 (2018) and 26 (2019) of these premises were processing at mortality rates less than 0.10%. Of the premises with higher mortality rates, none reported mortality of 0.20% or higher. MPI will continue to work with the processors who are experiencing higher than average mortality rates to identify where changes can be made in their practices to further reduce calf mortality.

The mortality rates in calves dead or condemned on arrival at processing premises were reduced by 12% in 2018 (compared to 2017) and by 17% in 2019 (compared to 2018), which seems to indicate that calves generally arrived in a better condition. Mortality of calves dying or being condemned while in lairage at processing premises decreased by 29% in 2018 (compared to 2017) and by 10% in 2019 (compared to 2018). A combination of calves arriving in better condition, and the requirement under the 'Maximum Time off Feed' regulation to process calves as soon as possible following arrival at a processing premises may play a role in this reduction.

3.2 MORTALITY AT PETFOOD PROCESSORS

MPI Verification Services undertook three announced audits and one unannounced audit at premises processing calves for petfood during the 2018 season. CCTV footage of calf handling was made available for audit at one of the premises.

One premise had an animal welfare case raised early in the season for non-compliant off-loading facilities. No animal welfare cases were raised as a result of verification at any of the other premises.

The mortality rate at petfood processing facilities was 0.095% for the 2018 season (22 calves, all CIY) and 0.23% (53 calves, all CIY) for 2019.

Petfood processors are allowed to slaughter calves on farm. Of the 40,082 calves processed for petfood in 2018 a total of 16,910 calves were slaughtered on farm, while 21,004 (out of 44,191) were processed on farm in 2019. This means fewer calves went through the process of transport and lairage.

4 Compliance with regulations in 2018 and 2019

Mortality rates at processing premises have been the primary measure of animal welfare for the bobby calf industry since 2008. Higher mortality rates can be caused by a combination of factors that the 7 calf regulations were put in place to address.

Compliance with calf regulations is monitored jointly by MPI veterinarians from Verification Services through their presence at processing premises, and by animal welfare inspectors from MPI Compliance. Concerns about calf welfare can be reported through a complaint to the MPI 0800 number or, if related to a specific incident, through the On Farm Verification programme, the Follow the Trucks programme, or at slaughter premises. More details on these programmes can be found on pages 7 and 8.

If there is evidence of an offence under the regulations or the Act, MPI will consider a range of options for dealing with offending. These may include providing education and assistance, issuing formal warnings, issuing a compliance notice, or infringing or prosecuting under the regulations or the Act. The approach to issuing infringements and prosecutions is outlined below.

4.1 MEAT PROCESSING PREMISES FOR HUMAN CONSUMPTION

MPI employs more than 200 veterinarians at meat processing premises who ensure food safety, and monitor animal welfare compliance on site. Calves that arrive at a meat processing premises are assessed by MPI Verification Services veterinarians at inspection, prior to slaughter. All calves that are unfit for transport or dead or condemned on arrival, or dead or condemned in the lairage, are assessed to determine the cause of death or condemnation (including post-mortem assessment).

Where the evidence gathered indicates non-compliance, MPI can issue an infringement and/or undertake further investigation for possible prosecution under the Act. Any investigation may include the farm owner, sharemilker, person in charge who signed the calf declaration, and/or the transporter.

Since 2008, MPI Verification Services has developed a procedure for dealing with unfit calves arriving at slaughter premises. These procedures ensure a consistent approach by processors when they assess calves on arrival at meat processing premises, and promote consistent messages to calf suppliers and transporters.

In conjunction with the industry, procedures are reviewed at the end of each calf season and as part of scheduled industry forums. The procedure will be reviewed again prior to the 2020 season to ensure it remains fit for purpose.

4.2 PETFOOD PROCESSING PREMISES

Petfood processing facilities do not have a full-time MPI veterinarian presence to monitor the welfare of calves, however these facilities are regularly audited under the Animal Products Act 1999. Part of this audit includes animal welfare compliance.

In 2017, MPI signed a memorandum of understanding with the petfood industry to provide data on mortality rates for young calves. This strengthened the agreement that was set up in the 2016 season to supply data to MPI on mortality rates, and allows for mortality at these plants to be monitored.

4.3 INFRINGEMENT OFFENCES

Infringement offences result in a fee but no criminal conviction.

Two of the regulations have infringement offences attached to them: Fitness for Transport and Loading and Unloading Facilities.

In total, 157 infringements were issued in the 2018 spring calving season and 96 in the 2019 season (Table 3). The majority related to breaches of the Fitness for Transport Regulation.

Table 3: Infringements to suppliers and transporters during the spring calving seasons 2016-2019

Season	2016	2017	2018	2019
Suppliers	2	130	126	96
Transporters	10	25	31	0
TOTAL	12	155	157	96

In 2018, 126 infringements were issued to suppliers and 31 infringements were issued to 15 transport operators. Eight of the transport operators received more than one infringement and re-offending was explained as being due to drivers not being able to detect defective calves despite best efforts. Of the 2018 infringements, eight were issued for calves at saleyards during four proactive visits. In 2019, there were 96 infringements issued to suppliers and none to transport operators.

The most common diseases/defects that resulted in infringements and warning letters under the Fitness for Transport Regulation were contracted tendons and blindness.

MPI will continue to discuss these outcomes with suppliers, transporters and meat processors with a view to identifying causes and delivering education to further reduce the problems.

4.4 PROSECUTABLE OFFENCES

Prosecutable offences under the regulations are more serious than an infringement offence and may result in a criminal conviction. A fine can be imposed by the court up to the maximum amount stated in the regulations, however there is no imprisonment associated with the regulatory offences. For this reason, prosecutable offences under the regulation are not designed to address the most serious animal welfare offences.

Animal welfare cases that are of a severe nature or involve multiple animals may still be considered for a prosecution under the Animal Welfare Act 1999, which carries more significant financial penalties and the potential for imprisonment or disqualification from owning animals.

Six of the regulations have prosecutable offences attached to them:

- Blunt Force Trauma Regulation;
- Maximum Duration of Transport Regulation;

- Loading and Unloading Facilities Regulation;
- Shelter Requirements Regulation;
- Maximum Time off Feed Regulation; and
- Transport Across the Cook Strait Regulation.

There was only one prosecution in the 2018 season relating to the transportation and handling of 12 bobby calves. There were no prosecutions in 2019. This demonstrates a high level of compliance and uptake by industry of the requirements for calves.

5 Monitoring activities undertaken by MPI

A number of programmes are run by MPI to monitor the impact of, and compliance with, the regulations. These are explained below, and include:

- On farm and saleyards monitoring and verification programmes;
- A proactive 'Follow the Trucks' programme implemented by MPI in collaboration with the transport industry; and
- Monitoring and verification of humane destruction and compliance with the Blunt Force Trauma Regulation at calf slink² processors.

All MPI compliance monitoring programmes and verification procedures will be reviewed in preparation for the 2020 season for all of the seven regulations taking into account the results from 2018/2019 seasons.

5.1 ON FARM AND SALEYARDS VERIFICATION PROGRAMME

MPI runs an On Farm Verification programme (OFV) where 1,200 farms are audited per year. In 2018, a total of 230 audits were completed on farm and at saleyards under the category bobby calves and dairy, with one case of non-compliant calf loading facilities being reported. No significant issues were identified, with facilities and management either meeting or exceeding minimum standards. In 2019, a total of 289 on-farm audits were completed on farms where the principal activity was dairy. In addition, 11 saleyards (at least 3 specifically targeting calves) were audited. No animal welfare cases were referred for infringement or prosecution purposes.

In addition to the saleyards visited under the OFV programme, Animal Welfare Inspectors conducted four unannounced inspections of saleyards in 2018. As a result of these inspections, eight infringements were issued.

5.2 FOLLOW THE TRUCKS PROGRAMME

MPI continued to run a proactive programme around the transport of young calves in 2018 and 2019. This programme involved MPI vets and animal welfare inspectors accompanying transport operators and slink operators when picking up calves on farm.

The programme covered requirements for loading facilities, the provision of shelter, information provided by the supplier to the meat processor, and obligations under the Maximum Time off Feed Regulation. The condition of the calves presented for transport was also inspected. It was largely educational and focussed on having an MPI presence on farm to support the implementation of the regulations.

Approximately 390 farms were visited in 2018. In 2019, 539 farms were visited, with 25 trucking companies and 41 bobby calf runs covered. In 2018, issues identified included those involving loading facilities and calves not being fit for transport, with two cases of blunt force trauma being referred to MPI compliance and two infringement notices given for presentation of unfit calves for transport. Two notices of direction were issued relating to unsuitable loading facilities. In 2019, there were 26 incidents involving unsuitable calves being presented for transport and 57 comments relating to

² A slink is a young calf that dies of natural causes or is killed on-farm, and is typically sold for processing into by-products (primarily leather and pelts).

loading facilities. Many of these issues were dealt with by education. In total, 10 cases were referred to compliance for formal investigation.

The programme was well received by industry and the majority of suppliers and transporters. However, some concerns were raised by transporters of being thought of as having brought MPI onto the farm and being concerned that they would lose their clients in a very competitive environment. While some farmers openly expressed support for the programme, others were angered that MPI had been on their farm without their knowledge.

MPI has also audited compliance with the Blunt Force Trauma Regulation at slink processing facilities. The audit reports provide information on animals that have been euthanised or have died of natural causes i.e. disease/exposure. The 2018 and 2019 reports show a very high level of compliance with the regulation and the use of humane methods of euthanasia.

5.3 INVESTIGATIONS FROM COMPLAINTS TO MPI

Between July and November 2018, there were 23 public complaints called in to the MPI 0800 number regarding young calves (replacements and bobby calves), while between these months in 2019, 25 public complaints were received. Following investigation, the majority of complaints were unsubstantiated, or it was concluded that the breach was minor and subsequently dealt with by education. No prosecutions were initiated.

6 Research identified causes of mortality and new welfare indicators

MPI commissioned research to identify causes and contributing factors to dairy calf morbidity³ and mortality; and practical welfare indicators for use on farm and at lairage, as an alternative to mortality rates.

The research programme comprised two studies. The first was conducted in the spring calving season in 2016 and the second during the autumn calving season in 2018.

The first study reported that every additional week into a farm's calving season increased mortality risk. In addition, the risk of mortality increased with the duration of travel and where the slaughter plant had a next-day slaughter schedule compared to a same-day slaughter schedule (however this was not the case when analysis was restricted to calves that were dead or condemned in yards). These findings were released in a report in July 2018⁴ and have since been published⁵.

The study also investigated potential indicators for assessing animal welfare in lairage. The most common indicators observed were dehydration (prolonged skin tenting) and diarrhoea (faecal soiling). Of the calves observed in lairage, 63% showed signs of at least mild dehydration and 44% showed signs of faecal soiling. Post mortem examinations at slaughter premises showed that diarrhoea and/or enteritis were predominant contributing factors for calves dying or being condemned.

The objective of the second study was to assess the validity of the skin tent test and other measures that could be practically assessed in an industry context to identify calves at risk of dehydration and welfare compromise. Preliminary results indicate that fluid deprivation of up to 24 hours only induces mild or mild-moderate dehydration in healthy calves that do not show signs of diarrhoea, suggesting that diarrhoea may have contributed significantly to the dehydration observed in the first study. The measures used to assess dehydration were considered relatively easy to perform in an industry setting.

³ Disease in calves.

⁴ <https://www.mpi.govt.nz/dmsdocument/30005-bobby-calf-welfare-across-the-supply-chain-final-report-year-one>

⁵ <https://www.sciencedirect.com/science/article/pii/S0167587719301874>

7 Summary and conclusions

Calf mortality rates of 0.05% and 0.04% were recorded in 2018 and 2019, respectively. The 2019 rate is the lowest recorded to date. While the 2018 infringement numbers remained relatively steady compared to 2017, there was a drop in 2019 and no infringements were issued to transporters. There was only one prosecution in 2018 and none in 2019.

MPI continued monitoring activities throughout 2018 and 2019 and reported good compliance with the calf regulations. In addition, research commissioned by MPI identified practical indicators for welfare assessment in calves at slaughter.

MPI will continue to work with industry bodies to maintain the high levels of animal welfare achieved for calves over the past several years, with a view to continuing to improve results, and where appropriate, use the regulatory tools now in place to achieve this objective. See <https://www.agriculture.govt.nz/protection-and-response/animal-welfare/safeguarding-programme/> to keep up to date.