

# A report into the effects of pre-transport curfew of livestock off feed and water

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Last reviewed 05 February 2024

*This document is a review of the scientific literature, including information from industry sources and legislative and regulatory reviews within Australia and internationally. This report is provided as information and its content is not to be construed as official NSW Department of Primary Industries (DPI) policy. Mention of trade names, products, commercial practices and organisations does not imply endorsement by NSW DPI.*

## Abstract

- Curfew or curfewing is the generic term used by livestock industries for the practice of restricting access to food and water prior to transport, sale or slaughter.
- The curfewing of cattle and sheep was adopted by the industry in an attempt to reduce faecal contamination during transport, improve animal welfare, minimise pollution risks and enhance food safety at processing facilities.
- The significant role of environmental conditions, the class of livestock and the health and condition of animals in determining appropriate curfew durations needs to be considered.
- There is a need to revise the definition of curfew to exclude any reference to water, based on the lack of clear evidence supporting that the removal of water reduces faecal contamination, benefits animal welfare, or enhances food safety.
- Practical recommendations for the duration of feed curfews can be developed based on an assessment of the scientific literature.

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## Background

Guidance is provided under the [Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock](#). Water can be withheld from livestock in Australia prior to transport, during transport, in saleyards and depots from anywhere between 12 to 48 hours depending on the species and class of livestock (Animal Health Australia 2012).

Curfew or curfewing is the generic term used in livestock industries for the practice of enforced food and water deprivation prior to transport, sale or slaughter (Fisher et al. 2006). Curfewing is a practice that is believed by industry to help reduce faecal contamination during transport, improve animal welfare, minimise pollution risks, and enhance food safety at processing facilities. Dry curfew is defined as the denial of food and water and wet curfew as denial of food only with access to water for a statutory period (Wythes 1982).

This practice has raised animal welfare concerns and has become a subject of debate in livestock industries. Opinions vary as to what total time off feed means. It could mean livestock have access

only to dry matter feed, such as hay, with no access to green feed and pasture, or access to no feed at all or no access to both feed and water.

Transport of livestock is essential to Australian livestock production systems. Livestock may be transported within or between properties or to a saleyard, abattoir or feedlot. The livestock transport practices and conditions in Australia are markedly different from those in many other countries due to Australia's size and climate. In Australia, livestock often undergo long journeys of up to 48 hours with no access to water or feed (RSPCA 2023). One study stated livestock regularly experience short to moderate periods of deprivation, 24-72 hours, during transport and marketing (Fisher et al. 2006). Animals are usually transported in livestock trucks, which are open and exposed to the elements, including heat and dust.

It has been widely reported that the transportation of livestock is a critical phase for the welfare of the animals (Grandin 1997). During the transport process, animals are exposed to multiple stressors simultaneously, including handling, loading and the unfamiliarity of the transport experience (Bhatt et al. 2021). These factors can trigger a psychological stress response in animals. The withholding of food and water, plus the need to stand and maintain balance during transport, can cause a physiological and fatigue challenge to the animals. The thermal and physical conditions of the vehicle and journey can present an additional risk to the physical well-being of livestock (Fisher et al. 2009) which may ultimately compromise their welfare.

This literature review focuses on recommendations for livestock transport practices, specifically addressing curfewing and what total time off feed means, and its impact on animal welfare. Standardising practices, considering nutritional backgrounds, minimising water deprivation, determining optimal curfew durations, understanding rumen capacity, and accounting for climatic conditions are key areas of focus. It is important to ensure livestock are transported within Australia in a way which conforms to current evidence and scientific knowledge of appropriate welfare practices.

## Review of science and literature

### Defining Welfare

Restricting animals from food and water during transportation contradicts the principles outlined in the 1965 Brambell report (Brambell 1965), which were defined by the Farm Animal Welfare Council as The Five Freedoms (Farm Animal Welfare Council 1979). These freedoms emphasise the importance of providing animals with essential conditions, including freedom from hunger and thirst.

Advances in animal welfare science in the past four decades have greatly improved our understanding of how farming practices affect animal well-being. The Five Domains Model has emerged as a prominent framework for assessing animal welfare on farms (Grandin 2022). The model underscores the significance of addressing the physical needs of animals and their emotional well-being. It emphasises the need to consider all aspects of an animal's welfare, rather than focusing on a single element. It is important to consider how restricting an animal's access to food and water during transportation for extended periods can affect their overall well-being, specifically in terms of hunger and thirst.

### Reasons for curfews

Meat & Livestock Australia (MLA) research identified curfewing livestock as a contentious issue within the industry (McGahan et al. 2010). The report found farmers and livestock transporters hold varied perspectives on appropriate curfew practices and the rationale behind these practices.

According to the available literature, pre-transport curfews are primarily used to reduce the volume of gastrointestinal content before transportation. This is thought to help reduce the total amount of excreta in trucks and soiling of hides and skins (Ferguson and Fisher 2008; McGahan et al. 2010).

Recommendations developed by industry are influenced by livestock transporters, who believe curfewing enhances the animals' ability to cope with the stresses of transportation. The Australian Livestock & Rural Transporters Association (ALRTA) claim stock with access to water and green feed don't travel as well compared with those that have had access to dry feed. It is believed animals full of green feed will empty quicker causing stress, weakness and instability leading to slipping, cattle down on trucks and deaths (Australian Livestock Transporters Association n.d.).

### **Curfews and welfare interactions during transport**

#### *Livestock travel better*

There is a noticeable scarcity of published data that supports claims that livestock travel is enhanced by curfews.

- Pre-transport curfews had no significant positive or negative effects on the ability of cattle and sheep to withstand transportation (Ferguson and Fisher 2008). Fisher et al (2006) found insufficient evidence to support the claim that ruminants' ability to handle transport is improved by pre-transport curfew.
- Water curfews do not significantly influence the cleanliness of livestock following transportation. It is not clear whether applying pre-transport feed and/or water curfews will lessen slippage and enhance the animals' capacity to maintain their balance while travelling (Walker and Banney 2011).
- The amount of effluent may be reduced by curfewing animals. However, it is important to consider that the design and construction of the stock crate floor, stocking density and the livestock transporters' driving, braking and cornering, are all major factors in loss of balance and slippage (Fisher et al. 2006).

#### *Dehydration and hunger*

Water deprivation is a more critical concern for animal welfare during transportation compared with food deprivation because of the risk of dehydration. Water is required by all animals for survival including maintenance of body systems, fluid balance, body temperature and electrolyte concentrations. Livestock dehydration can be evaluated by observing the condition of their mucous membranes, assessing skin tenting and noting the positioning of their eyeballs. Periods of water restriction may pose a risk to animal health and welfare as it can disrupt their normal physiological processes, leading to dehydration. (Hogan, Petherick, and Phillips 2007).

#### *Cattle*

- Journeys of 12 to 24 hours will lead to fatigue in cattle. Physiological changes may take 24 hours or longer to resolve, depending on the class of animal and feeding regime during the recovery period (Farm Animal Welfare Committee, 2019).
- Cattle travelling without water can develop electrolyte imbalance in their plasma which can lead to dehydration. Cattle restricted from feed for more than 12 hours start to mobilise their glycogen reserves. These changes are thought to be associated with the initiation of hunger. (EFSA Panel on Animal Health and Welfare et al. 2022).

- Prolonged hunger can lead to frustration, exhaustion and a weakened condition. These effects can be intensified if the journeys are in hot environments, involve high stocking densities and are paired with motion stress. Animals should have access to water to the point of transport. There is no proof of any advantage to water deprivation prior to transport (EFSA Panel on Animal Health and Welfare et al. 2022).

### *Sheep*

- Sheep are well adapted and tend to be more resilient to food and water scarcity than most other livestock. The removal of water for sheep prior to transport poses little welfare risk, as long as the climatic conditions and total deprivation period do not result in dehydration (Fisher et al. 2009).
- Slaughter lambs or adult sheep can tolerate withdrawal of water for up to 22 hours at cool temperatures, without increasing their water intake when it is provided. However, suckling lambs are more sensitive to dehydration after only 5 hours. Healthy adult sheep can cope with food deprivation for 2 to 3 days by mobilising body reserves. The withdrawal of animals from pasture up to 30 hours before transport can occur without metabolic depletion, although the animals may experience the adverse consequences of hunger (Farm Animal Welfare Committee 2019).

### *Loss of body weight*

Live weight loss is one of the most important economic effects, because of weight based trading of animals.

- Deprivation of food and water during transport is the major factor which accounts for loss of body weight (Marques et al. 2012).
- Curfew duration has a significant impact on liveweight, with 5.2 % and 7.9% reduction reported following 12 and 24 hours of food and water deprivation respectively (Ferguson and Fisher 2008).
- Feed curfews should be less than 24 hours primarily for food safety reasons and to prevent carcase weight loss (Walker and Banney 2011).

### *Effluent production*

Effluent from livestock transport is a potential environmental, commercial, and social risk for the livestock industry.

- Pre-transport feed curfews do lower faecal volume. However, periods of food deprivation can result in increased levels of pathogens such as *E. coli* and *Salmonella* being excreted in the faeces (Ferguson & Fisher, 2008; Hogan et al., 2007). These zoonotic pathogens can be transferred onto the carcase from the hide during slaughter and dressing processes present a human welfare risk in processing establishments and a food safety risk. To lower this risk Hogan et al, (2007) advised the total time off food and/or water should not exceed 24 hours.
- Whilst the benefits of a curfew may be evident in cattle grazing lush green pasture with a high moisture content (80 to 90%), the effects in animals on feedlot diets (< 30% moisture) have not been researched in Australia (George et al., 2022).
- Feeding hay for the 48 hours prior to and up until the point of transport is the most beneficial pre-slaughter feeding strategy. This technique resulted in firmer faeces, and the reduction in the excretion of *E. coli* during transport (Pethick 2006).

- Where the only source of feed is green and lush, a short pre-transport feed curfew, for 6 hours, may be advantageous. This short curfew is unlikely to pose a welfare concern for the animals (Walker and Banney 2011).

#### *Other welfare interactions during transport*

The total journey time and the transport driver's experience and driving ability had an impact on the animal's ability to withstand transportation (Cockram et al. 2004; Grandin 2000).

- Feed and water deprivation does not account for all the stresses placed on an animal during transport. Livestock transporters' driving ability is a major factor in causing bruising, weight loss and stress. Downed cattle are more likely to occur in overloaded trucks (Grandin 2001).
- Longer journeys have more impact on animal welfare compared with shorter trips. However, it's crucial to understand that the welfare challenges and stress animals experience during transportation aren't solely linked to the journey's duration. Various factors, including environmental temperatures, access to food, water and rest periods, collectively influence the animals' overall experience, alongside the duration of the journey (Bhatt et al., 2021).

#### **Factors influencing curfew periods**

The breed, age, body condition, reproductive status and overall health of the livestock play a role in determining the appropriate curfew duration.

#### *High temperature and environmental conditions*

- Transportation during summer resulted in greater loss of body weight (Bhatt et al. 2021).
- When sheep and cattle were transported early in the morning there was less excreta, resulting in less vehicle and hide contamination. Excreta increased by 70% for sheep and 21% for cattle when livestock were transported later in the day. Hogan, et al (2007) proposed that this was due to grazing patterns early in the morning.
- Adult cattle require 35-80 litres of water per head each day. In hot weather, animals use more water for evaporative cooling. Water consumption can increase by 78% in extreme conditions. In normal conditions with good quality water, consumption in summer will be about 40% higher than in winter (NSW DPI 2014).

#### *Livestock in poor condition*

- Livestock with reduced stomach contents, young, or undernourished livestock, may be more susceptible to the physical and metabolic impact of feed and water deprivation. A combination of feed deprivation, the effects of enteric pathogens triggered by loss of digesta and other stress responses can negatively impact immunocompetence and can trigger diseases such as shipping fever (Hogan et al. 2007).
- Cattle with a body condition (BC) of 0 should be fed for 4-6 weeks before reassessing for transport. Those with a BC of 1 should have continuous access to dry feed and water until loading. If time off feed is unavoidable, it should be a for a maximum of 4 hours (Blackwood et al. 2013).

### Metabolic stress

Stress is a broad term that implies a threat is present to which the body needs to adjust (Von Borell 2000). Handling and transportation are considered major stressors for farm animals (Grandin 1997). Stressors, such as hunger and thirst, cause physiological changes in the animal that can lead to the progression of diseases (Von Borell 2000). Metabolic diseases affect energy production and can damage tissues critical for survival (Allen 2022).

- Transit tetany typically affects transported cows, ewes in late pregnancy and growing animals. It may affect any class of livestock. Transit tetany is caused by a sudden drop in blood levels of calcium and magnesium, affected animals develop a staggering gait, become recumbent, comatose and often die. The high metabolic demands of pregnancy, lactation and growth for both calcium and magnesium are exacerbated by the prolonged food deprivation associated with transportation, resulting in the disease. Grazing of lush pasture, heavy feeding with grain or pellets prior to transport, and forced exercise immediately after transport also increases the risk (Allen 2022; Jubb and Perkins 2024).
- Pregnancy toxemia in ewes, referred to as ketosis in cattle, is a metabolic disease that affects older overweight, pregnant and animals in early lactation. Rapid growth of the foetus, particularly multiple foetuses, in the last third trimester of pregnancy results in a large metabolic demand for blood glucose. If that glucose is not supplied by the diet, fat is mobilised from body reserves. When large amounts of mobilised fat overwhelm the processing capacity of the liver, it results in high blood levels of ketones and acidosis. This affects brain function leading to signs of blindness, disorientation, tremors and eventually recumbency and death. Factors found to predispose an animal to this disease include lack of feed and water availability or a sudden feed change, as occurs due to curfewing and transportation (Campbell, Pearson, and Tibary 2015).
- Stress, including livestock transportation and restricted access to feed and water, has been consistently linked to the depletion of glycogen levels in muscles, which affects meat quality (Ponnampalam et al. 2016).

### Australia and other jurisdictions

Jurisdiction	Feed and water curfews - practiced or not; relevant legislation and guidelines
Australia	<p>Practiced</p> <p>Each state and territory has their own animal welfare legislation. The <a href="#">Australian Animal Welfare Standards and Guidelines – Land Transport of Livestock</a> were endorsed by state and territory governments in 2009. Each state and territory has incorporated the majority of those standards and guidelines into their own relevant legislation.</p> <p>Standards</p> <ul style="list-style-type: none"><li>○ Cattle over 6 months and sheep over 4 months must not exceed 48 hours off water.</li><li>○ Cattle known to be more than six months pregnant excluding the last four weeks, lactating cows with calves at foot or calves one to six months old time off water must not exceed 24 hours.</li><li>○ Calves 5-30 days old must not exceed 18 hours off water.</li><li>○ Lambs under 4 months must not exceed 28 hours off water.</li><li>○ Pregnant sheep (excluding the last two weeks) must not exceed 24 hours off water.</li></ul>

	<p>Guidelines</p> <ul style="list-style-type: none"> <li>○ Additional considerations are recommended for travelling long distances reducing the time off water for cattle over six months and sheep over 4 months old to 36 hours off water; for calves, lactating cows, and cows and ewes in the third trimester of pregnancy to 12 hours; lambs under 4 months to 20 hours.</li> <li>○ Sheep should be fed dry hay or fibre before transport to sustain them for the journey, particularly if they are lactating or weak.</li> </ul> <p>There is no reference to time off feed before transport for cattle.</p>
New Zealand	<p>Practiced</p> <p>The <a href="#">Code of Welfare: Transport within New Zealand</a> applies to everyone transporting any live animal within New Zealand.</p> <p>Standards</p> <p>Animals must be appropriately prepared for transport, including through the provision of sufficient food and water, as appropriate to the species, age, condition and expected length and conditions of the journey, so that pain, injury or distress to themselves or other animals is avoided.</p> <p>Guidelines</p> <ul style="list-style-type: none"> <li>○ Ruminants should be held off pasture, with water provided, for a minimum of 4 hours but for no more than 12 hours before travel (considering the condition of the animals).</li> <li>○ Animals that are held off pasture prior to transport should be provided with an appropriate alternative feed source (such as hay for livestock).</li> </ul>
United Kingdom	<p>Not common practice</p> <p>In the UK, England, Scotland, Wales and Northern Ireland each have their own set of national regulations that provide the necessary legislation to allow the administration and enforcement of the <a href="#">Council Regulation (EC) No 1/2005</a>. The Council Regulation (EC) No 1/2005 establishes broad principles and standards to those who transport cattle and sheep in connection with an economic activity i.e., farmers, livestock haulers.</p> <p>Standards</p> <ul style="list-style-type: none"> <li>○ Mammals shall be fed at least every 24 hours and watered at least every 12 hours. Journey times should not exceed 8 hours for cattle and sheep, (unless additional requirements are met) to allow food and water access.</li> <li>○ If additional requirements are met maximum transport time for cattle and sheep is 14 hours and 9 hours for calves and lambs without access to feed and water.</li> </ul> <p>Guidelines</p> <ul style="list-style-type: none"> <li>○ After 14 hours of travel, cattle and sheep must be given a rest period of at least one hour sufficient for them in particular to be given liquid and if necessary, fed. After this rest period, they may be transported for a further 14 hours.</li> </ul>

USA	<p>Practiced</p> <p>There is no federal law in the United States that governs conditions during domestic livestock transportation, other than the maximum duration of travel before rest that is detailed in the <a href="#">Twenty-Eight Hour Law</a>.</p> <p>Standards</p> <ul style="list-style-type: none"> <li>○ If livestock are being transported for longer than 28 consecutive hours, they must be offloaded for at least 5 consecutive hours to get feed, water, and rest.</li> </ul>
Canada	<p>Unclear - no literature found</p> <p>The <a href="#">Health of Animals Regulations</a> applies to all Canadians involved in transporting animals either directly or indirectly.</p> <p>Standards</p> <ul style="list-style-type: none"> <li>○ Require that animals be fed and watered within 5 hours before being loaded.</li> <li>○ Animals should be provided with feed, rest and safe water at intervals that do not exceed 36 hours/or 12 hours for compromised animals.</li> </ul> <p>Guidelines</p> <ul style="list-style-type: none"> <li>○ The Health of Animals Regulations require that animals be fed and watered within 5 hours before being loaded, if the expected duration of the animal's confinement is longer than 24 hours from the time of loading.</li> <li>○ It is recommended that: 1) animals intended for a trip length more than 12 hours have access to appropriate feed and water within 5 hours before being loaded, and 2) animals being loaded for trips more than 4 hours receive feed within 24 hours prior to loading.</li> </ul>
EU	<p>Not common practice</p> <p>The <a href="#">Council Regulation (EC) No 1/2005</a> applies to everyone in the EU who transports cattle and sheep in connection with an economic activity i.e. farmers, livestock haulers.</p> <p>Standards</p> <ul style="list-style-type: none"> <li>○ Mammals shall be fed at least every 24 hours and watered at least every 12 hours.</li> <li>○ Journey times should not exceed 8 hours for cattle and sheep, (unless additional requirements are met) to allow food and water access.</li> <li>○ If additional requirements are met maximum transport time for cattle and sheep is 14 hours and 9 hours for calves and lambs without access to feed and water.</li> </ul>

## Industry practice and standards

### Cattle industry

A survey was commissioned by MLA to assess cattle husbandry practices across the nation in 2015/2016. Researchers identified that 54% of cattle producers incorporated a feed curfew into their practices, while 41% enforced a water curfew before cattle transportation for slaughter. Most producers (96%) applied feed and water curfews lasting less than 24 hours, with 51% enforcing either a feed or water curfew for less than 12 hours (Howard and Beattie 2018a). The primary reasons cited



for implementing feed and/or water curfews were that stock travel better (66% feed; 69% water) and were less messy (50% feed and water). Conversely, reasons for not applying these curfews included concerns about dehydration, stress, condition and weight loss (Howard and Beattie 2018a).

### Sheep industry

Howard & Beattie (2018b), surveyed sheep husbandry practices across Australia in 2015-2016. They found that most sheep producers (96%) choose to impose a feed curfew, while 90% of them also implement a water curfew for their animals prior to the transport of slaughter stock. The average feed curfew on farms across the country was 14.6 hours, with 23% of producers using a feed curfew more than 24 hours. The primary reason for imposing these feed and/or water curfews was the belief that stock travel better (71%) (Howard and Beattie 2018b).

### Livestock transporters

MLA surveyed members of the Australian Livestock & Rural Transport Association. This revealed a significant concern within the industry related to curfewing practices. Respondents expressed that insufficient curfewing negatively impacted animal welfare during the transport of livestock (Fraser 2014). Drivers reported that animals subjected to insufficient curfewing conditions tend to experience discomfort and heightened stress during transportation. Furthermore, experienced drivers pointed out that such circumstances can lead to issues like downers and animals sliding in accumulated effluent, potentially causing stains on their skins. This staining can reduce the animals value and heighten the risk of *E. coli* contamination. Additionally, suboptimal curfewing practices can result in effluent leakage from stock crates during transport, leading to increased washout costs and complicating the task, particularly in the presence of water restrictions (Fraser 2014).

### Guidelines available to industry

This table highlights industry guidelines in Australia for livestock feed and water curfews before transportation, demonstrating inconsistencies in recommendations.

Organisation	Feed curfew	Water curfew
<b>National Heavy Vehicle Regulator</b> (National Heavy Vehicle Regulator 2022)	<ul style="list-style-type: none"> <li>Green feed curfew periods are 6 hours for cattle and 12 hours for sheep and goats.</li> <li>Feed curfew exceeding 12 hours should be avoided.</li> <li>Provide access to good quality dry feed as an alternative to green feed curfew.</li> </ul>	<ul style="list-style-type: none"> <li>Water curfew should ideally be kept under 12 hours for animal comfort.</li> </ul>
<b>MLA</b> (MLA n.d.)	<ul style="list-style-type: none"> <li>Hold stock off feed for 8-12 hours prior to transport if possible.</li> </ul>	<ul style="list-style-type: none"> <li>Hold stock off water for 8-12 hours prior to transport if possible.</li> </ul>
<b>Meat Standards Australia</b> (MLA 2020)	<ul style="list-style-type: none"> <li>Cattle to have access to feed prior to dispatch.</li> <li>Sheep - total time off feed not greater than 48 hours before slaughter.</li> </ul>	<ul style="list-style-type: none"> <li>Cattle are to have access to water outside of transport.</li> <li>Animals to have access to water at all times while not in transit.</li> </ul>

## Conclusion

The practice of curfewing, which involves withholding food and water from animals before transport, is a complex and contentious issue within the Australian livestock industry. Generally, the industry believes, curfewing reduces faecal contamination, improves animal welfare, minimises pollution risks, enhances food safety, and enhances the animals' ability to cope with the stresses of transportation. However, there is a lack of consistent scientific evidence supporting these claims. Research is required to better understand curfewing and its optimisation. The definition of curfew should be revised to exclude any reference to water, as the literature lacks clear evidence supporting the removal of water to reduce faecal contamination, enhance animal welfare, or improve food safety. It is important to note that restricting animals from water differs significantly from restricting feed. This practice contradicts the principles outlined in The Five Domains Model and leads to negative welfare outcomes.

In reference to feed curfews, there needs to be a clear distinction between time off green feed or lush pasture versus time off dry feed or hay.

Pre-transport curfews have no significant impact on cattle and sheep's ability to withstand transport. However, truck loading, transport conditions and driving behaviour can significantly impact their welfare during transit. Design and construction of stock crate floors, stocking density, and driver practices significantly affect balance and slippage issues during transport. Other factors which have a significant impact on the welfare of animals during transportation include: the duration of transport; the class, body condition and health of stock, environmental conditions and access to food and water before travel.

Certain classes of stock, including young, lactating and heavily pregnant animals and those with poor body condition are more vulnerable to the negative impacts of feed and water deprivation. Negative impacts can include frustration, exhaustion, weakened conditions and dehydration and possible death.

Effluent production during transportation is influenced by pre-transport curfews. The overall impact is complex and affected by factors such as feed type (green vs dry) and stress. Determining the appropriate duration of a curfew involves assessment of environmental conditions, livestock class and animal health. Tailoring curfews to specific characteristics and conditions is crucial to maximise animal welfare during the transportation process.

Recommended curfew durations prior to the transport of livestock depend on three factors - environmental conditions, the class of livestock, and the health and condition of the animals.

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