



# Appendix

## Appendix 19.1 Transport of Live Farm Animals versus Carcasses

In February 1882, the sailing ship *Dunedin* left New Zealand on a voyage to London, UK. It was carrying frozen sheep carcasses for the newly formed Bell-Coleman Mechanical Refrigeration Company. When the meat reached London 12,000 miles and 98 days later, *The Times* newspaper reported:

Today we have to record such a triumph over physical difficulties as would have been unimaginable very few years ago. New Zealand has sent into our London market five thousand dead sheep in as good condition as if they had been slaughtered in some suburban abattoir.

(*The Times*, 1882)

In 1890, Samuel Plimsoll – now known mainly for the Plimsoll Line on ships indicating the depth to which they can be safely loaded – published the book *Cattle Ships*, describing the conditions during live transport as ‘prolonged torture’ (p. 54). In view of this and other major problems, such as the spread of infectious diseases and disasters at sea, from fires to shipwreck, he asked:

... why cattle for food are imported alive at all, seeing that great quantities of beef are imported in a refrigerated state from America, Australia and New Zealand.

(Plimsoll, 1890, p. 4)

Furthermore, the chief inspector at Smithfield’s, London’s main meat market, told Plimsoll that the best beef to eat was that which came over as dead meat, because the animals brought over alive were injured on the journey, reducing the quality of the carcass.

Plimsoll’s manifesto also complained that unscrupulous salesmen were passing off live imports as locally reared animals – an issue still current in the 21st century.

In the 21st century, more than 60 billion farm animals yearly – plus many others – are transported at least once, to slaughter. That includes many exported live from one country to another; for example, 6 million sheep per year transported from Australia to the Middle East (Fisher and Jones, 2008). Reasons include preferences for fresh meat, financial arrangements by the operators, requirements for religious slaughter and the availability of slaughterhouses. There is considerable scientific evidence that long-distance transport causes many welfare problems for farm animals. The European Food Safety Authority is one of an increasing number of organizations that takes such evidence seriously, and says that:

Transport should therefore be avoided wherever possible and journeys should be as short as possible.

(European Food Safety Authority, 2004, p. 1)

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## Appendix 19.2 Sustainability in Latin America

In many Latin American countries, meat production was traditionally based on extensive pasture conditions, with negative effects on the soil and on the climate through emissions. Agricultural activities seriously threaten natural resources, so it is necessary to ensure that livestock production is sustainable. It is now clear that there is a strong need to adopt alternative, sustainable livestock production systems that use integrated management in the neotropical, biophysical context, where the natural environment, including mixed forests, is used inappropriately for open grazing of livestock.

Studies performed mainly in Central America conclude that silvopastoral systems (Fig. 19.4E) have the potential to improve animal productivity, increasing the biological and economic efficiency of livestock farms while contributing to the ecological sustainability of these areas (Ibrahim *et al.*, 2010). In countries like Uruguay with a temperate climate, meat production constitutes an item of great economic significance. Studies showed that weight gain in animals that had access to shade in summertime was 200 g/day more than those that grazed an open field without trees (Simeone, 2012). Furthermore, these schemes produce lower emissions of methane and carbon dioxide, so they are an important tool for mitigating climate change, while minimizing the effects of climate extremes such as drought, heavy rain, frost and drying winds (Harvey *et al.*, 2013). A cattle production system that minimizes greenhouse gas emissions and has potential for obtaining wood from trees is considered sustainable; it also reduces injury and stress in animals, maximizing welfare (Naranjo *et al.*, 2012).



**Fig. 19.4E. Cattle in a silvopastoral system. (Courtesy of Fernanda Pérez-Lombardini.)**

<http://www.cabi.org/openresources/90202>

Thus, more effective use of land resources, improving animal welfare and increasing biodiversity is possible in temperate and tropical environments (Murgueitio *et al.*, 2008; Broom, 2010). As high temperatures can cause poor welfare, shade provided by

trees reduces the risk of overheating. According to Broom *et al.* (2013), the skin temperature of cattle in a silvopastoral system can be 4°C lower than on pasture on hot days. Animals are more relaxed and calm, with less fear and disturbance (Ocampo *et al.*, 2011). Moreover, Améndola *et al.* (2013) found that silvopastoral cattle showed more cohesive social behaviour and 44% longer resting times than those in monoculture systems. Foraging times were reduced by high temperature and humidity in the latter, but not in the silvopastoral system.

Silvopastoral systems provide animals with permanent shade, shelter, food and water, contributing to their welfare and providing a valid and sustainable alternative to conventional farming in Latin American countries (FAO, 2006; Broom *et al.*, 2013).

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