



Balancing consumer and societal requirements for sheep meat production: An Australasian perspective



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ABSTRACT

Although there has been a decline in sheep numbers in Australia and New Zealand, both countries remain significant producers and exporters of sheep meat. The ongoing demand for more sustainable and ethical animal farming systems and practices requires sheep production industries to be both vigilant and responsive to consumer and the broader societal needs. Demonstration of continuous improvement in animal welfare is paramount and the welfare risks and challenges confronting Australasian sheep industries now and into the future are discussed.

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1. Introduction

The prosperity of sheep meat industries globally is contingent on their ability to consistently meet the demands and requirements of consumers, as well as those of society in general, which includes non-consumers. In the context of consumer requirements, quite often our thoughts focus on the primary visual (e.g., colour, fatness, marbling) and sensory (e.g., tenderness, juiciness, flavour) traits. However, we now accept that in their purchasing decisions, some consumers apply a more holistic approach and consider a wider range of factors other than how the product looks and their evaluation of the potential eating experience. This forms the basis for the broader societal requirements evident particularly in developed countries where there is an increasing emphasis on the ethical and environmental dimensions of the animal production system (Rollin, 1995; Montossi, Font-i-Furnols, del Campo, San Julian, Brito, & Sanudo, 2013).

The demand for more sustainable farming systems that, in particular, recognises both the mental as well as physical needs of livestock is being echoed by consumers and non-consumers alike. Non-consumers include individuals or groups that consider animal welfare to be paramount but range in their views on animal farming from those avidly opposed to others that support farming but choose, through a range of

factors (cultural, religious, lifestyle, etc.), not to consume some or all animal products. Indeed, it is the voice of non-consumers in combination with animal welfare agencies and successful mass media campaigns that has become increasingly more powerful and influential in shaping the animal welfare agenda. The call for the cessation of live export of sheep from Australia to the Middle East and painful husbandry procedures such as mulesing, or at the very least, the provision of analgesia, are two clear examples relevant to sheep production.

Clearly, the ongoing commitment to improving the “quality of life” of livestock on-farm is equally as important as that focused on improving sheep meat quality in the context of balancing consumer and societal requirements for sheep meat industries. This paper explores this issue in more detail from an Australasian perspective and examines the at-risk production, pre-slaughter and slaughter practices and the progress towards mitigating the associated welfare risks. Finally, the future animal welfare landscape and the implications this may have in terms of sheep meat production and product quality will be discussed.

2. Sheep production in Australia and New Zealand

2.1. New Zealand

Sheep in New Zealand are managed under outdoor pastoral based grazing systems. The majority of the flocks are located on extensive hill country and integrated with beef cattle production. Stocking rates are around 7–12 sheep per hectare, mostly with no supplementary

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feed or housing (Morris, 2013). The New Zealand sheep industry is dominated by the coarse woolled breeds such as the Romney, Perendale and Coopworth. These breeds are dual purpose in nature producing both meat and wool with a fibre diameter greater than 30 μm . However 'meat production' is the main source of income for sheep and beef farmers with wool sales accounting less than 12% of the average farmer income (Beef + Lamb NZ, 2013a). Whilst those farmers with finer woolled breeds such as the Merino and Corriedale still have a focus on wool, they account for only 8% of the national flock (Beef + Lamb NZ, 2013a).

In New Zealand ewes are mated in autumn (predominantly March to May) to ensure lambs are born to coincide with the spring pasture flush and to minimise the impacts of adverse weather on lamb survival. Maiden ewes have traditionally been mated at 18 months of age; however approximately 30% of maiden ewes are now presented for mating at 8–9 months of age. Lambs born to these maiden ewes account for only 4% of total lambs weaned each year due to lower weaning rates. The national ewe flock average weaning rate was 121% in 2012 (Beef + Lamb NZ, 2013b) whilst for ewes mated at 8–9 months, the average weaning rate was 60–70%. The mid-point of lambing occurs in September.

Sheep numbers in New Zealand have declined from almost 60 million in 1990 to 31 million in 2013 (Beef + Lamb NZ, 2013c) but total carcass production remains similar to the levels from 30 years ago. Since the 1980s, there has been an increase of 25% in both lambing percentage and carcass weight (Morris, 2013). The increase in carcass weight has been driven by an improvement in the average lamb growth rate of 50 g/d from birth to slaughter (Morris, 2013). Labour inputs have reduced concomitantly and sheep productivity per labour unit has improved by at least 35% (Morris, 2013). The average carcass weight in 2013 was 18 kg (Beef + Lamb NZ, 2013c) compared to 14 kg in the late 1980s. Approximately 24 million lambs are slaughtered each year for meat production (Beef + Lamb NZ, 2013a).

New Zealand is the largest exporter of lamb in the world accounting for around 47% of the world's trade in lamb (Morris, 2013). More than 90% of New Zealand lamb and mutton is exported with 50% being supplied to the European Union (Beef + Lamb NZ, 2013a). Given this, lamb producers in New Zealand are very susceptible to any changes in animal welfare policy or consumer perceptions and expectations in these EU countries. The export volume into Asia has increased significantly and at the end of 2013, China was the largest single market by both value and volume for New Zealand sheep meat (Meat Industry Association, 2014). Domestic consumption of lamb and mutton per year per capita is 7.5 and 2.8 kg respectively (Beef + Lamb NZ, 2013a).

Post-weaning the average lamb growth rate is approximately 100 g/d. This, combined with lambing mostly occurring in spring, results in a marked seasonality in the supply of stock (85–90% of slaughter occurs during the months November to June inclusive). The average slaughter date is in late February/early March period indicating that the average lamb is slaughtered at 6 to 7 months of age, based on a September average lambing date.

2.2. Australia

In Australia, the national sheep flock has undergone a significant decline particularly over the last three decades. Sheep numbers peaked at 180 million in the early 1970s and have declined steadily until 2007 where the flock remains between 70 and 75 million head (ABARES, 2014). The sheep industry can be divided into two production sectors; one primarily focused on the production of wool and the other dedicated to the production of lambs for slaughter. However, there are also a significant proportion of dual purpose enterprises. Wool production is based on the Merino breed and is concentrated in extensive pastoral regions predominantly in New South Wales, Victoria and Western Australia. Australia is the largest exporter of wool, particularly the high quality finer micron wool, accounting for 44% of total export volume in 2012 with the majority exported to China (ABARES, 2014). The export value of wool is estimated at \$3.0 billion in 2013/14 (includes

semi-processed wool and fellmongered skins; ABARES, 2014). The wool production sector also accounts for the majority of mutton produced in Australia and sheep exported live to the Middle East. Australia is one of the largest exporters of mutton exporting approximately 96% of the total mutton produced (183 kT) in 2012/13 (MLA, 2013). Live export numbers have declined over the last two decades but are expected to remain steady at 1.75 million head/year (ABARES, 2014).

Lamb production is most concentrated in south eastern Australia particularly in medium to higher rainfall regions (>500 mm/year). The sector comprises both specialist prime lamb and dual purpose (meat/wool) enterprises. With the southern concentration of lamb production in Australia, lambing typically occurs in autumn–early winter. Crossbreeding underpins both systems and the adoption of genetic improvement has resulted in significant gains in productivity (growth, fertility), carcass and meat quality traits (fatness, eye muscle area) (Hopkins, Stanley, Martin, & Gilmour, 2007; Hopkins, Stanley, Martin, Toohey, & Gilmour, 2007). Prime lambs are typically second cross produced from crossbred ewes (e.g., Border Leicester \times Merino) that have been joined with terminal sire or meat sheep breeds, such as White Suffolk and Poll Dorset. In dual purpose systems, first cross lambs are generated from the joining of Merino ewes with a terminal sire breed. The slaughter age of lambs will vary between production systems and regions and the national average carcass weight has increased 4% from 1999 to 20–21 kg in 2009 (Hooper, 2009).

In specialist lamb production systems, the finishing of lambs on forage crops or irrigated pasture is relatively common. Finishing of lambs in feedlots is also practised but this tends to be more opportunistic, largely influenced by the price of feed grain and done for relatively short periods of 4–6 weeks, with an emphasis on improving fat score and muscle glycogen concentration more so than liveweight. Preparation of animals for live shipping is perhaps the largest feedlotting activity in terms of sheep numbers, albeit for short periods. The minimum holding time as specified in the Australian Standards for the Export of Livestock varies depending on the species, time of year and voyage duration but typically ranges from 2 to 5 days (Anonymous, 2002). Some abattoirs also operate feedlots to assist with managing the supply of finished lambs for slaughter.

As a consequence of sustained high prices for lamb meat, largely driven through increased export demand, the proportion of the Australian ewe flock joined to terminal sire breeds has been steadily increasing (Holmes Sackett, 2010). This is also highlighted in the improved profitability of lamb production relative to beef and wool over a sustained period (Holmes Sackett, 2010). Australia currently exports 50% of lamb meat produced (MLA, 2013) which has grown significantly from the volume (15%) exported in 1990 (Hooper, Blias, & Ashton, 2003). Domestic consumption of lamb meat remains steady between 9 and 9.5 kg/capita/year (ABARES, 2014).

3. Contemporary welfare issues in sheep meat production

The main societal and consumer concerns that are currently relevant to all livestock industries revolve around the following primary issues:

- Restriction of movement (e.g., housing systems, extensive vs intensive production systems)
- Surgical husbandry practices
- Mortality and disease induced by the production environment and/or system
- Long distance transport of farm animals for economic reasons
- Humane slaughter.

Indeed, in some cases, they have attracted significant media attention and public outcry such as the practice of exporting cattle and sheep to developing countries where cultural differences prevail with respect to animal welfare particularly at the point of slaughter. Most, perhaps with the exception of restriction of movement, are also

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