Sustainability – overview

Jersey is the most sustainable of the common dairy breeds

Jersey produce more profit (approximately 8%) than Friesian when stocked at optimal stocking rates.

Jerseys are kinder on the environment at the cow, whole farm and industry level

- More dry matter consumed goes into milk and less into maintenance reducing the greenhouse gas emission and urinary nitrogen excretion per Kg DM consumed
- Nationally, Jerseys have higher genetic merit (BW) which means greater profits and lower GHG emissions and urinary N excretion
- Jersey herds require fewer replacements because of less mastitis, lameness and anoestrus. This increases profit and reduces GHG emissions and urinary N excretion at the farm level

Jerseys are more suited to once-a-day milking systems as they are more efficient at producing milk solids on a liveweight basis and have less wastage from mastitis and udder collapse

Jerseys are more heat tolerant. The air temperature/humidity level that triggers a drop in milk production and signs of animal distress is significantly higher for Jerseys than Friesians. This will become even more of an issue as the planet warms up further.

Sustainability - Discussion

Inherent efficiency of Jersey means higher profits

A jersey cow is very efficient at converting dry matter into milk. Most studies in NZ and internationally indicate the feed conversion efficiency of Jersey (gMS/kg DM) is superior to Friesians in the order of 9-13%[12,15,25,27] and as high as 18.7%[27]. Differences are even greater when expressed as g MS/kg body weight – in the order of 20-30% more MS/kg body weight produced by Jerseys compared with Friesians[12,15,25,27], due to a combination of the increased feed conversion efficiency and the fact Jerseys eat more per kg liveweight (kg DM/kg BW) than Friesians[12,15,25,27]. These findings are found for both total mixed ration and pasture based diets but, on average, are greater for pasture based systems[27] . For both gMS/kgDM and kg DM/kg BW, JXF animals are generally intermediate between parent breeds with a small but significant heterosis component[25].

In a farmlet study at Ruakura in 1992[2], Kg milk fat per hectare was 13% higher and protein 2% higher for the Jersey farmlet when Jerseys and Friesians were stocked to maximise net income (In this study this was 3.7 cows/ha for Jerseys and 3.0 cow/ha for Friesians). Jerseys produced 10% more gross milk and 5% more net milk income than Friesians. The relative value of milk fat to protein in 1992 was 0.55. Today it is 0.89, which, given that most of the Jersey gains were in kg milk fat per hectare, would translate as a net milk income advantage for Jerseys today of about 8% rather than the 5% reported in 1992[2]

The Jersey difference in FCE is greater on a pasture/roughage diet[12,27], where stocking rates are moderate to high[2] and during the first third of lactation[29].

Jerseys are kinder on the environment

If a Friesian herd is replaced by a Jersey herd of similar genetic merit and at numbers to produce the same amount of milk solids, the maintenance requirement of the Jersey herd will be 5.5[19]-8[8]% less than the Friesian herd. At the whole farm level, less feed required for maintenance, means less production of greenhouse gasses and urinary nitrogen[19,27]. These differences will be reflected in reduced GHG and N leaching outputs from Overseer[24]. In essence, without impacting significantly on MS production, a farmer with a herd containing a high proportion of Friesian genetics can reduce both the GHG emissions and N leaching figure derived from Overseer if these animals are replaced with cows of predominantly Jersey genetics.

Higher Breeding worth of Jersey means greater efficiency and less environmental impact

At the whole farm level, a high genetic merit herd, (high BW) is more efficient at converting drymatter into milk solids than a low genetic merit herd and therefore has lower greenhouse gas and N emissions per ton of DM[1,34]. As of February 2018, the national average breeding worth of mixed-age Friesians and JxF was 57% and 87% of Jerseys. For 2017 born heifer calves the national average BW of Friesians and JxF was 73% and 97% of Jerseys respectively[28]. Consequently, as things currently sit, Jerseys will produce less greenhouse gas and N than other breeds because of their inherently greater FCE and their higher average BW. This trend of greater genetic merit of cows containing Jersey genetics is

likely to continue into the future as, at February 2018, the top 30 BW daughter proven bulls that are the sires of the next generation of cows consist of 71% Jersey genetics and just 29% Friesian genetics[23].

Less wastage of Jersey improves profitability and reduces environmental impact

Reducing wastage in the dairy population is another way to improve the sustainability of dairy herds as fewer replacements need to be reared.

Jerseys have a number of advantages in this space. Studies consistently demonstrate that Jerseys develop less clinical mastitis[14,16,20] and lameness[9,18] than Friesians and JxF. In one large NZ study, the seasonal cumulative incidence of clinical mastitis was; Friesians, 15.8%, JxF, 12.4%, Jersey, 7.6%[20]. Mastitis and lameness combined account for almost 75% of total disease problems on farm in NZ[35] and are a significant cause of cows being culled.

Numerous studies also confirm that Jerseys have a higher rate of cycling prior to mating than other breeds which results in less hormonal intervention and/or improved in calf rates[21,35].

Ultimately, lower wastage means fewer replacements are required and/or allows for a greater rate of genetic gain – both of which add up to less GHG emissions and urinary nitrogen loss for the whole farm system. Fewer replacements also reduces rearing costs, thus improving the profitability of the whole farm system.

Jersey is more adaptable to once-a-day milking systems

Milking once a day (OAD) compared to twice daily is gaining popularity in the NZ dairy industry. In 2016, 9% of herds were milked OAD for the entire season and 47% of herds milked OAD as part herds or part seasons[11]. OAD milking saves energy, needs less water for milk cooling and shed washing and requires less labour. All these improve sustainability.

Like twice a day milking systems, the Jersey in a OAD system is more efficient than both Friesian and JxF cows when expressed as gMS/kg LWt. When farmed together on OAD, Jerseys produced 9% and 6% more milk solids per kg liveweight than Friesian and JxF respectively over the first 150 days of lactation[17] .

The Jersey breed is the most adaptable to a OAD milking system due to its more concentrated milk. This means that the negative impact of OAD on milk solids production is less[11] and, farmer opinion is that udder breakdown is reduced compared with those breeds that produce less concentrated milk, like JxF and F cows. OAD systems are more sustainable from an energy, water and labour use perspective. This sustainability is maximised if the herd is Jersey as there is reduced culling because of udder breakdown and mastitis[16], and therefore fewer replacements required.

Jerseys are more heat tolerant

Whether measured as ambient temperature or calculated as the temperature-humidity index (THI), Jersey cows tolerate the heat much better than Friesians. As ambient temperatures increase, Friesian cow rectal temperature, heart rate, respiratory rate and milk solids production changes at a lower temperature than Jersey[7,26]. Jerseys will tolerate an average temperature humidity index (THI) of 75 over a 24-hour period (or 25.5C at 70% humidity). In contrast, the Friesian level of tolerance is lower at a THI of 68 (or 21C at 70% humidity. For every unit of THI above this maximum tolerable level, there is a production loss of 10g MS/day[7, www.dairynz.co.nz].

As our climate warms, the relative heat tolerance of Jerseys will become a significant benefit of the breed.

Less pasture and soil structure damage with Jerseys is probably a myth

It is general opinion that Jerseys produce less pugging/treading damage to soil or pasture than heavier Friesians and crossbred cattle. However, this opinion is not supported in the literature, due to the fact there is a direct correlation between hoof size and body weight meaning the hoof-ground interface is largely equal between breeds[30].

Sustainability - References

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