



“The time is now to address Climate Change As the future of the industry share your vision of what a sustainable dairy operation should look like.”

Introduction

The global dairy industry continues to grow in line with global population, with factors such as urbanisation and the income of the middle class increasing. The consumption of both fresh and processed dairy products is likely to increase by 2.1% and 1.5% a year retrospectively over the next decade (AHDB, 2019). Although UK dairy cow numbers have fallen by 28% between 1996 and 2020, milk yield per cow has increased by 100% since 1975 with the average Holstein cow producing 7330 litres/year and pedigree animals up to 8600 litres/year over three lactations (Holstein UK, 2021). This mass increase in milk production has caused an 18% increase of dairy greenhouse gas emissions (methane, nitrous oxide and carbon dioxide) contributing to global warming and therefore, climate change.

Although the dairy industry emitted more than 1,700 million tonnes of CO₂ in 2015, nearly the same amount from aviation and shipping combined (Kasriel, 2020) . There are many areas that can be managed in a sustainable manner to reduce the impact of dairy farming on climate change.

Soil Health and Management

Soil is one possibly the most important asset on any farm yet is one that has been most abused with great losses in its ability to store carbon, high levels of compaction and loss of topsoil. Soil health and management can often be overlooked within the dairy industry as typical arable practices such as cultivation, drilling and harvesting are often completed by outside contractors with little knowledge of individual farms soil health status. However, sustainability is being achieved by regenerative farming practices to repair soil health through systems such as minimum tillage, soil testing and appropriate fertiliser applications. Creating the ability to produce a higher yielding crop on a smaller land area to allow for other areas to be managed in a more biodiverse and wilding manner. Such as planting of trees and hedgerows to absorb CO₂ , optimising drainage to protect water courses from run off due to compacted soil and providing a habitat to fauna who will protect crops from disease and aid pollination.

Electricity

Electricity is an essential component for powering the parlour, maintaining bulk tank temperatures, lighting cow houses, heating calf milk etc. Although a necessity, if not sustainably used it can become the main contributor to greenhouse gas emissions. Energy on the farm is not equally distributed around 30% is consumed by the vacuum pump, however using a variable speed drive can reduce electricity used by 40-50%. The issues surrounding energy use within the dairy industry is well known and there are already renewable options such as solar, wind and anaerobic digesters but these sustainable options are not necessarily cost-effective for smaller family run dairy's. Which is why sustainable solutions such as running pipes under straw yards or manure piles to heat water as it circulates can be used to wash down parlours or mix milk powder. Regular maintenance of all electrical equipment will not only keep machines running longer but at a lower energy rate and making subtle changes such as replacing energy consuming lights for LED lights or insulating pipes and boilers to optimise heat retention.



Water

Clean water is needed across the dairy industry from processors to dairy farmers, where it has many uses and therefore, liable to waste. It is estimated that by 2050 clean water may become scarce due to increased demand, reduction in water sources and pollution to water courses (Nature.com, 2020). Clean drinking water for livestock accounts for 50%-75% (fwi, 2010) of the total water use on farm, in some cases this can be higher due to a drier feed ration or high lactating cows, both factors common in Holstein herds. The Dairy Roadmap (2008) has already reached dairy producers and processors to reduce their water usage and environmental impact, such as reducing hose pressure in routine practices (eg. washing the parlour). The collection and harvesting of rainwater are key in the vision of how a sustainable dairy enterprise can operate especially in high rainfall areas, such as Northern Ireland. With warmer, wetter winters and drier summers already occurring due to climate change, collection of rainwater will assist through periods of drought. The collected rainwater can be used in the following areas, watering livestock, animal husbandry (footbathing) and washing down parlours/yards. To ensure sustainability, the farmyard itself should undergo regular inspections to ensure gutters and downpipes are clear of debris and water cannot enter slurry/silage stores to produce effluent and jeopardise nearby water courses.

Herd Management

Balancing sustainability, herd management and animal welfare can be challenging. Increasing milk production from an individual cow aims to meet supply, however, creates more demand on the animal which can reduce lifetime lactations. Increasing the lactation period is a potential opportunity to become more sustainable in milk production, however, again proposes animal welfare challenges. A supported theory by DAERA (2021), suggests that reducing the average of first calving from 27 to 24 months will reduce the dairy industry's greenhouse gas footprint by 7% as less inputs such as land or forage is needed. The evolution of dairy genetics and sexed semen has created higher yielding cows with selected traits such as butterfat and protein, however, these cows require high inputs. A vision for sustainable dairying is to select bulls and breed from pedigrees that are much better at converting feed to milk than others, reducing the animals total carbon footprint such as Ecofeed (Cogent, 2021).

Conclusion

Leaders of the dairy industry are striving to create a profitable industry, whilst maintaining animal health and welfare and reduce the impact on the environment caused by milk production. As a young individual within the industry the future looks challenging yet with support from others, education from specialists and freedom to implement sustainable measures on farm my vision of sustainable dairying can be achieved. Simultaneously maximising milk yield and cow life span, with less inputs by selective breeding to convert feed at a better ratio without risking animal health.