

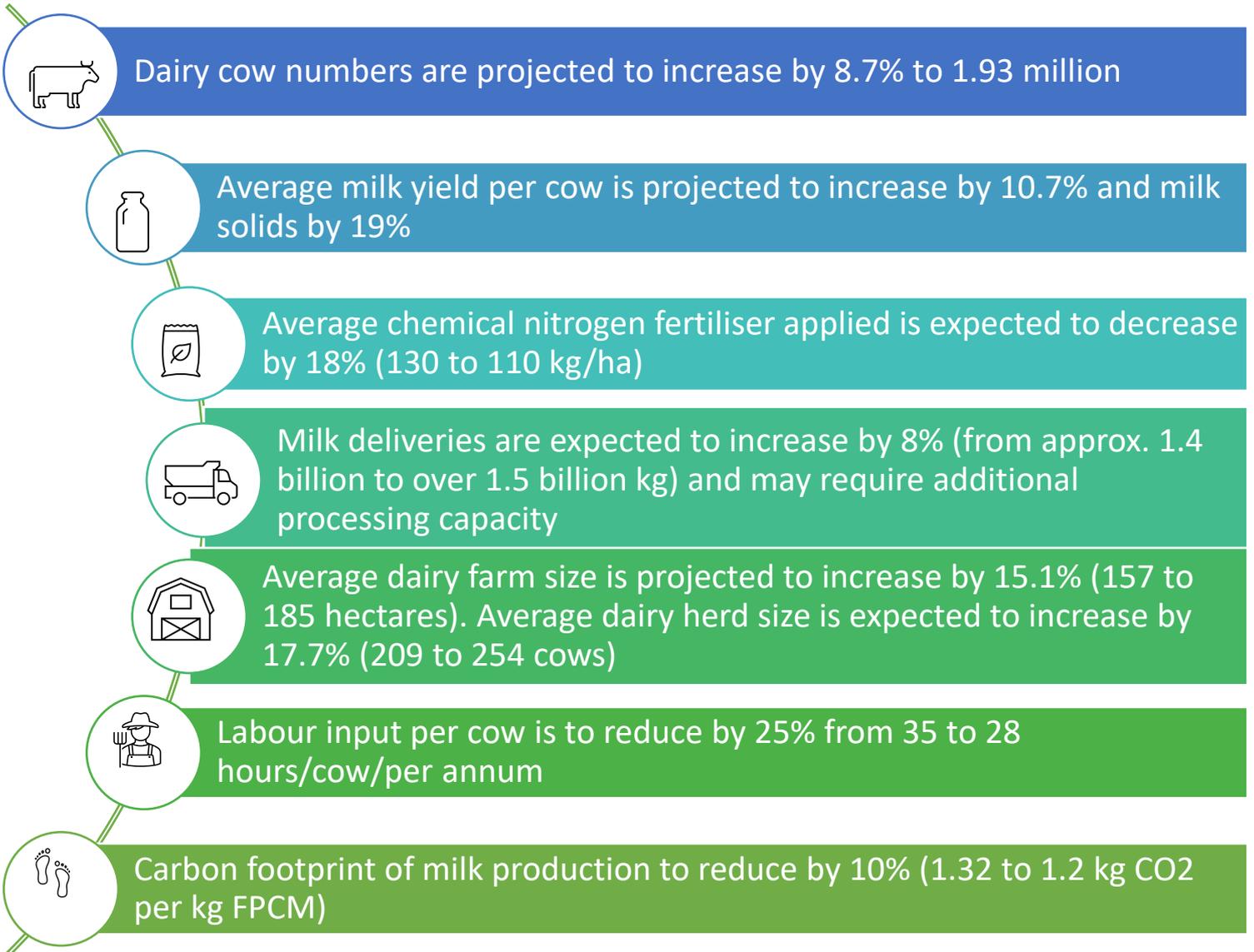
Analysis of the Scotland dairy sector to 2030

Milk deliveries are expected to increase if the processing capacity no constrain the rise



WORK PACKAGE 4
DAIRY SECTOR ANALYSIS

Overview of outlook to 2030:

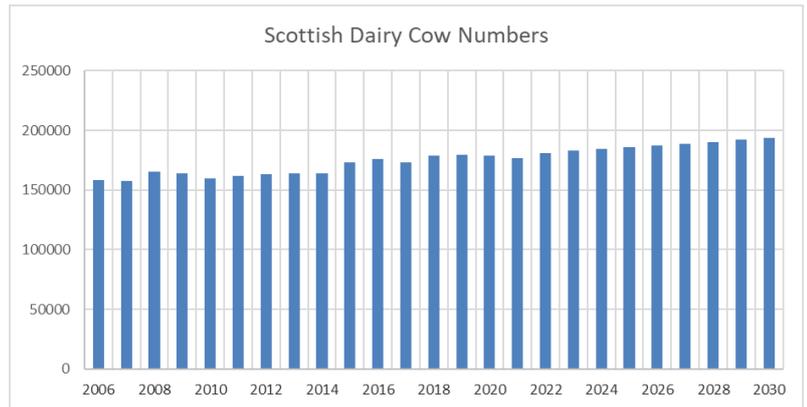


- Projections are subject to no trade disruption as a result of Brexit, CAP reform or future free trade agreements.
- Projections subject to no major environmental policy changes associated with climate change, water quality or biodiversity.

Analysis of key performance indicators for Scotland

DAIRY COW NUMBERS

Following estimations based on cow numbers in previous years (AHDB, Scottish Government, Scottish Dairy Cattle Association), dairy cow numbers across Scotland are expected to increase by 8.7% from 1.76 million in 2019 to 1.93 million in 2030. The Scottish Dairy Cattle Association (SCDA) noted that in recent years there has been more stability in the Scottish



dairy industry with increased milk and cattle prices and increased cow numbers, despite decreasing herd numbers. They have also noted increased investment with new parlours and cattle housing being installed.

PRODUCTIVITY

Projected growth in milk output in Scotland not only corresponds to increased dairy cow numbers expected by 2030 but from the projected increased productivity per cow. If future policies looked to reduce or constrain cow numbers in the future, this projected increase in productivity is important for the Scottish dairy industry.

Average milk yield per cow is projected to increase by 10.7% over the 2019 to 2030 period (8,062 to 9,030 kg per cow) with milk solids per cow expected to increase by 19% from 572 kg to 704 kg per cow. This increase is expected to occur due to improved genetics and increased health, welfare, and efficiency, with little change to diets, as the volume of concentrates fed per cow is not expected to change vastly from 2019 to 2030. It is also noted that recent improvements in milk from forage in Scotland are expected to continue, further improving yields without an increase required in concentrate feeding levels.

Although an increased herd size could be expected to place additional requirements on labour input, productivity gains and corresponding economies of scale are expected to result in a 25% reduction in per cow labour input from 35 hours/cow/per year (2019) to 28 hours/cow/per year in 2030, based on previous Farm Management Handbook (SAC) figures. Better reliance on precision livestock farming (PLF) tools to improve time management, efficiency and health, welfare and production on farm will all help to alleviate labour input requirements as well as improving overall performance.

MILK DELIVERIES & PROCESSING CAPACITY

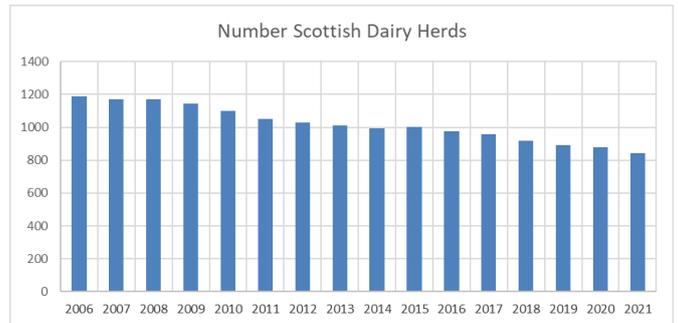
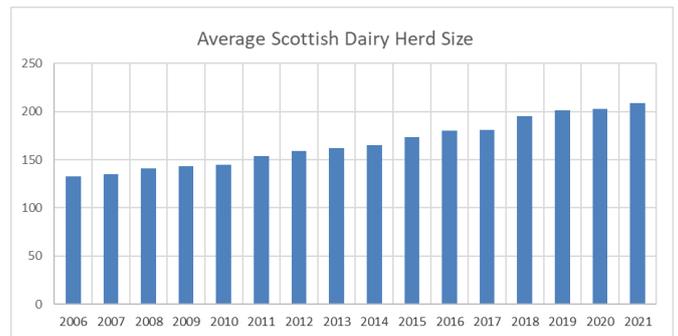
Milk deliveries across Scotland are expected to increase by 8% in the 2019 to 2030 period, corresponding with the increase numbers of dairy cows and increased production per cow. However, the limited processing capacity in Scotland may constrain the level of milk production. Currently, 5 main processors account for 94% of milk collections in Scotland. Increased milk outputs would require additional processing capacity in Scotland to accommodate these volumes. However, it's not clear whether this could occur as a result of increased capacity in existing plants (recent expansion has doubled capacity in McQueens Dairies for example) or whether the existing constraints would simply increase the volume of milk sent to England and Wales for processing (currently 18%).

The Scottish Dairy report "Rising to the Top 2030" developed by the Scottish Dairy Growth Board (SDGB), suggests that there is a need, desire and want to grow the processing capacity and capability over the next 5-10 years to ensure sustainability of Scottish dairying. The report details recommendations for not only investing in current facilities but proactively attracting inward investment to Scotland and ensuring support in place for continued process investment, production innovation and ensuring Scottish processors respond to climate change challenges in manufacturing.

DAIRY FARM STRUCTURES

In 2021 there were roughly 836 dairy herds in Scotland, farming approximately 106,000 hectares of dairy farmland, with 65% of herds based in southwest Scotland. If herd numbers continue to decline on the trajectory they have been following to date, it is estimated there will be approximately 642 dairy farms in Scotland by 2030. Despite losing many herds, data from the Scottish Dairy Cattle Association has shown some new entrants to dairying yearly, primarily in the southwest. Additionally, the SCDA note that farm losses or cutbacks should also be seen as an opportunity for new and existing dairy farmers to invest in good breeding cow families and their genetics.

Despite the continuing decrease in number of farms, both the herd size and the size of farm in hectares are expected to increase from 2019 to 2030 based on historic trends. Average farm size is expected to increase from 157 Ha to 185 Ha and average herd size from 209 to 254, with more large and small specialised farms, and less medium sized farms expected.



Environmental footprint

The Scottish dairy industry recognises its responsibility to minimise its environmental footprint where possible and the strong marketing opportunity of a “clean, green Scotland” in the current climate, as detailed in the SDGB report *Rising to the Top 2030*. Whilst parts the world face water shortage issues, Scotland is currently well placed to exploit their good natural grass growing conditions – a positive for both the industry and consumers.

The Scottish Governments Climate Change (Scotland) Act 2019 has set intermediate emissions reduction targets for 2030 of at least 75% lower net emissions than the baseline year of 1990. The SDGB expects by 2023 that 50% of Scottish farms will have undertaken new carbon reduction activities and bring forward the 75% reduction to 2026. The SDGB expects that by 2030, 100% of Scottish dairy farms will participate in activities which reduce their environmental impacts. Recommendations for strategic dairy farm networks across Scotland to demonstrate best practice, continue research and improve KE, as well as annual carbon reduction assessments, support and alignment with Scottish Government climate change ambitions will all help support these actions.

In 2018, agriculture accounted for 18% of Scotland’s total GHG emissions, with a significant share coming from nitrogen fertilisers (1.4% of Scotland’s total GHG emissions are from soil and are as a consequence of applying nitrogen fertilisers). With the Scottish dairy industry under pressure to demonstrate their environmental credentials from both a policy and consumer perspective, reductions in things like use of chemical fertilisers on farm are expected. Expert opinion and estimates from the Farm Management Handbook expect reductions in chemical nitrogen fertiliser applied (kg/ha) from 130 kg/ha in 2019 to 110 kg/ha in 2030. Scotland’s Climate Change Plan update (Scottish Government, 2020) envisages that nitrogen emissions, including from nitrogen fertiliser, will have fallen through a combination of improved understanding, efficiencies and improved soil condition (Scottish Government, 2020). Inclusion of clover in grassland decreases the need for nitrogen fertiliser because atmospheric nitrogen is fixed by the clover through the action of symbiotic bacteria, making nitrogen available to the clover and to grasses in the sward could reduce emissions by nearly 300 kt CO₂e, or 11% of the target, within the next 15 years, if adopted on 40% of grassland (Lampkin et al., 2019). The use of nitrogen fertiliser can be substituted if the area of grassland with clover can be increased (Wiltshire et al., 2020).

With the adoption of a suite of climate friendly farm level practices on dairy farms across Scotland, including improving efficiency, health, welfare, fertility and production, the aim is to reduce the average carbon footprint of milk production from 1.32 kg CO₂ per kg Fat and Protein corrected milk (FPCM) in 2019 to less than 1.20 in 2030. This could be reduced even further with adoption of other cattle related mitigation measures, such as 3NOP feed additive, breeding for low methane emissions and a slurry store cover with impermeable cover. These mitigation measures could be expected to save between 57 and 854 kg CO₂e every year for each animal they are applied to and are the most effective of many studied (Eory et al, 2020).

A report from WWF Scotland on delivering net zero for Scottish Agriculture (Lampkin et al., 2019) highlighted a number of measures to reducing GHG emissions from livestock and grassland farming in Scotland. These included:

- Reducing methane emissions associated with ruminants by using feed additives including 3NOP, nitrates, probiotics, high dietary fat sources and seaweed derivatives could make a significant contribution. However, this would require approval of 3NOP as a feed additive so that it can be marketed, and at an affordable price.
- Improved animal health and breeding, with increased fertility, growth rates and yields, and reduced morbidity/mortality could reduce total livestock numbers needed to deliver the same output and deliver 366 kt emission reductions (14% of the target) with 40-50% uptake.

In terms of biodiversity the habitat area on the average dairy farm is projected to increase by 10% by 2030.



Environmental challenges

Scotland, as part of the UK, is still committed to the EU National Emissions Ceilings Directive (NECD) (2016/2284/EU), which entered into force on 31 December 2016. This covers national emission reduction commitments of ammonia (NH₃) reduction compared with 2005 base year of a mandatory reduction of 8% between 2020-2029.

Ammonia is a reactive nitrogen compound which is released when slurries, manures and nitrogen fertilisers come into contact with the air. Ammonia, and therefore fertiliser value, can be lost whenever slurry or manure is exposed in this way and so practices that reduce exposure in housing, storage or during application to crops can cut losses and result in the more efficient use of organic and inorganic fertilisers, thus saving businesses money in the long run. Recovering as much nitrogen as possible will maximise returns from farm inputs and good practice in managing soil, manure, fertiliser and feed will help reduce ammonia losses.

A consultation was completed during 2021 (Cleaner Air for Scotland 2 (CAFS 2)) that set out how the Scottish Government will deliver further air quality improvements over the next five years. The results of this consultation will dictate how the reduction in ammonia will be achieved and if legislation is needed.





Macro environment

A Brexit withdrawal agreement was signed off by the UK government at the end of 2020. Under legislation passed at Holyrood last year, the Scottish Government continues to administer the CAP scheme, and this will last for a least a 5-year transition period. Trade with Northern Ireland (NI) has already been affected by the withdrawal agreement as extra paperwork is needed to comply with the movement of some foodstuffs including cheese. One of the Scottish pilot farms has suspended trading with NI as it is currently uneconomical for them to continue to sell their cheese into that market and it is proposed by food traders that this could continue or get worse. The Office of National Statistics has calculated that there had been a fall in Scottish dairy exports of 50% in January 2021 as new regulations have made it more complicated and time consuming. It is still difficult to predict how the continuing effect of Brexit and the current Covid 19 pandemic will affect production and exports of Scottish dairy products over the next 10 years.

However, the SGDB predicts in it's Rising to the Top 2030 publication that continued investment in dedicated resources to build awareness and sales of Scottish dairy products at home and internationally could double markets internationally and drive artisan product opportunities in the UK by 2030. The SGDB aim to do this through an International Growth Champion focused on growing shares in international markets, raising awareness of Scottish products domestically and internationally and market opportunities for new product development, developing a "Scottish cheeseboard", creating a Market Development Program to build long-term sustainability and more.

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Contact : Holly Ferguson and Maggie March



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