



GLOBAL DAIRY PLATFORM

Submission by the Global Dairy Platform (GDP) To Participate in the Koronivia Joint Work on Agriculture Workshops Bonn, Germany October 2020

Executive Summary

The Global Dairy Platform (GDP) is a global non-profit organization that creates, guides and governs programs in support of the dairy sector's commitment to responsible food production. GDP seeks to advance awareness of the global dairy sector's ongoing activities to produce nutritious food efficiently and safely, and to contribute to future multi-sectoral efforts that can ensure a global sustainable food system for all.

As a part of these efforts, GDP is seeking an opportunity to present impact data and information at the upcoming KJWA meeting in Bonn in October regarding various ongoing global dairy sector programs designed to minimize future GHG emissions while contributing to global food security. As outlined in the accompanying document, GDP is currently conducting programs associated with both workstreams to-be-highlighted at the KJWA meeting: 2(e) Improved livestock management systems, including agropastoral production systems and others; and 2(f) Socioeconomic and food security dimensions of climate change in the agricultural sector.

In the accompanying document, detailed information on multiple ongoing implementation-focused projects initiated by the dairy sector that seek effective and responsible ways of achieving climate stability and global food security are highlighted. The role the dairy sector plays in not only providing healthy and nutritious foods in local communities, essential food security, and lifting people, primarily in rural and developing countries, out of poverty through daily cash flow and related endeavors are discussed as well.

In addition, efforts by the dairy sector to align its sustainability targets to those of the UN Sustainable Development Goals (SDGs) are discussed, as are ongoing programs in a number of developing countries to bolster dairying and the entire supply chain involved in bringing dairy to market, as well as improving the health and employment opportunities of the people in these countries.

Among the initiatives GDP implements, oversees, and funds that are outlined in the accompanying document are:

- **The Dairy Sustainability Framework (DSF)**, which seeks to align sector actions under 11 key sustainability criteria with climate health implications. These areas are: GHG emissions, market development, nutrients, working conditions, waste, animal care, water, rural economies, soil, product safety & quality, and biodiversity. The DSF is currently working with farmers all over the world (30% of global milk production is operating under the DSF) to generate a robust database that will allow the sector to more accurately assess its strengths and weaknesses (both globally and regionally) in order to create pathways toward a more sustainable global dairy sector. The DSF is a pre-competitive and collaborative initiative that monitors and reports on the dairy sector's continuous sustainability improvement, encouraging members to share solutions in order to more rapidly implement and spread best practices, regardless of where members are located. For example, a GHG reduction initiative in Denmark may provide inspiration for an initiative in Rwanda.



- **Mapping of the DSF Criteria to the SDG's**, a study undertaken by Rabobank and supported by the DSF, quantifies the role of dairy production in supporting the delivery of the SDG's. This work clearly demonstrates the responsibility of the dairy sector in actively delivering improvement programs under both DSF and SDG's.
- **Development of a joint FAO/GDP study** that analyzed GHG emissions from the dairy sector over a ten-year period from 2005-2015. This study also identified potential mitigation measures focused on reducing emission intensity and absolute emissions in the dairy industry. Additional data will be collected every 5 years to assess sectoral progress and flag areas where further research and development may be necessary to stimulate improvement.
- **Development of a global NET ZERO - Pathways to Low Carbon Dairy** initiative which builds upon existing efforts from FAO and other agencies as well as leading private sector dairy companies to develop tools and methods that can be implemented globally to de-carbonize the dairy sector.
- **Creation of a document, Dairy's Impact on Reducing Global Hunger**, co-written by FAO, GDP, Global Agenda for Sustainable Livestock (GASL) and IFCN Dairy Research Network that provided quantitative evidence for the potential impact of dairy in eradicating hunger (SDG2) and generating employment opportunities in many low- and middle-income countries (SDG1).
- **Development of a joint report FAO entitled Dairy Development's Impact on Poverty Reduction** that cites data indicating dairy provides a major pathway out of poverty, as well as a means of women's empowerment by creating opportunities for women in the developing world to lead and create businesses in regions where few such opportunities exist.
- **The Dairy Nourishes Africa (DNA) initiative** that seeks to transform the dairy industry in Africa, to address key societal challenges such as childhood malnutrition, and economic opportunity. The first DNA pilots have been scoped in Tanzania, and demonstrate the opportunity for improving the health, economics, and education system of the entire country.

In addition to the activities highlighted in the accompanying document, GDP also developed and oversees:

- **A Dairy Impact Methodology** program which seeks to identify ways that dairying aids in economic and social development in numerous developing countries.
- Various **health and nutrition research initiatives**, including a protein quality project aimed at developing a gold standard method for more accurately measuring the quality of both plant and animal-based protein sources.
- **A study assessing cattle health and GHG emissions** in collaboration with the Global Research Alliance on Agricultural Greenhouse Gases (GRA). The DSF commissioned the project in three different geographical regions to better understand the benefits of improved cattle health and associated emissions. In addition, the project is exploring the requirements of Animal Health Improvement Measures to support governments who may wish to include cattle health improvement programs into their reporting.



- **A project supported by an IFAD grant to develop the dairy sectors** in India, Kenya, Vietnam and Rwanda via the development of sustainability programs (using the DSF) and quantifying the social impact of proactive actions in these regions. The project will connect local private sector organizations and over 4500 farmers in a two-year period and will focus on both mitigation and adaptation opportunities.

GDP encourages UNFCCC Parties to recognize the current efforts of the dairy sector in mitigating GHG emissions and adapting to climate change while working to ensure food security in local communities across a growing world population. We would welcome the opportunity to participate in the workshop in a meaningful way.

We wish to thank the Koronivia Joint Work on Agriculture Secretariat and SBSTA and SBI Chairs for considering this submission.



**Submission by the Global Dairy Platform (GDP)
In Response to Decision 4/CP.23**

**Koronivia Joint Work on Agriculture (KJWA)
On topics**

**2(e) Improved livestock management systems, including agropastoral production
systems and others**

and

**2 (f) Socioeconomic and food security dimensions of climate
change in the agricultural sector**

Key points

- The dairy sector recognizes the importance of and is committed to making effective and responsible contributions to global efforts to achieve climate goals and food security.
- To limit climate change, the dairy sector has taken action to more accurately quantify emissions across the full value chain and reduce them through all economically viable mechanisms.
- Both plant-and animal-based foods produced via sustainable systems can help achieve climate change adaptation and mitigation.
- Milk and dairy foods are naturally rich sources of a wide range of nutrients, and make a significant contribution to nutrient intake, diet quality, and food security.
- Livestock serves as a major pathway out of poverty in rural areas and in developing countries.

Introduction

The Global Dairy Platform (GDP) welcomes the opportunity to contribute its views and recommendations to topics 2(e) and 2(f) under the Koronivia Joint Work on Agriculture (KJWA). GDP is an International non-profit organization that provides direction and support to the global dairy industry. GDP's membership of dairy companies, associations, scientific bodies and other partners collaborate pre-competitively to build evidence on dairy's role in the diet, and to demonstrate the sector's commitment to responsible food production. GDP seeks to advance global awareness on the dairy sector's ability to produce nutritious food efficiently, safely, and sustainably.

Climate change, along with population growth, poverty alleviation, environmental degradation, global food insecurity and, more recently, pandemics are key defining challenges of the 21st century¹. The world is experiencing shifting weather patterns that cause more frequent floods, storms, droughts, and forest fires, and their consequent damage to the environment, people's livelihoods, and food security. Dairy production systems are a source of Greenhouse Gas (GHG) emissions, notably methane (CH₄), nitrous oxide (N₂O), and

¹ <https://dairysustainabilityframework.org/wp-content/uploads/2019/01/Climate-Change-and-the-Global-Dairy-Cattle-Sector.pdf>



carbon dioxide (CO₂). The dairy sector is committed to responsibly reducing its environmental footprint and working towards a low-carbon future to achieve climate security.

Without forward-looking win-win policies in multiple sectors, however, climate change will continue to intensify, posing additional challenges and further increasing food insecurity. The real challenge for policymakers as well as the dairy sector is to reduce environmental impacts and climate insecurity while simultaneously meeting society's needs. With the right technical support, enabling policies, and appropriate levels of engagement, the dairy industry has the potential to contribute to the sustainability of the livestock sector as well as global food security.

2(e) Improved livestock management systems, including agropastoral production systems and others

Sustainable management of livestock systems-The Dairy Sustainability Framework (DSF)

The dairy industry recognizes the environmental and sustainability challenges related to its use of natural resources, and the impacts generated by the production of milk and dairy products. GDP and other dairy industry members developed a Dairy Sustainability Framework (DSF) to provide overarching alignment of the sector's global sustainability actions². The DSF outlines strategic objectives for the sector in eleven relevant areas:

- | | |
|----------------|---------------------------|
| -GHG emissions | -Market Development |
| -Nutrients | -Working Conditions |
| -Waste | -Animal Care |
| -Water | -Rural Economies |
| -Soil | -Product Safety & Quality |
| -Biodiversity | |

Key sustainability criteria are established for each of the three sustainability pillars³. The dairy sector is committed to working toward achieving the objectives set by the DSF.

I. Methodology to measure GHG emission in the dairy sector

One of the strategic purposes of the DSF is to quantify GHG emissions across the full dairy value chain. The biggest challenge in quantifying GHG emissions from any production system is the application of a consistent method. Fortunately, through the International Dairy Federation (IDF), a '[common methodology](#)' for milk production and processing has been developed by the sector.

The IDF methodology allows:

² <https://dairysustainabilityframework.org/the-gdaa/programmes-of-the-gdaa/the-dairy-sustainability-framework/>

³ <https://dairysustainabilityframework.org/dsf-membership/global-criteria/>



- The dairy sector to ‘talk the same language’ and invest effort in solving the challenge as opposed to investigating different methodological approaches.
- Comparison of GHG emissions between cattle dairy products; for example, ‘cheese’ or ‘liquid milk’;
- Identification of GHG emissions from the farm to the manufacturing gate recognizing that the majority of emissions are in the area of focus of the methodology (not including transport from manufacturing gate to retailer, or consumer impacts);
- Identification of areas where there is potential for reducing emissions if they are particularly large or the reductions are easy to realize.

The IDF methodology provides the DSF with consistent results calculated on the same functional unit. Members of the DSF report their starting point and subsequent evaluations of progress by utilizing this consistent methodology.

The IDF methodology is consistent with a range of international inputs and existing standards, including those of the IPCC, Carbon Trust, World Business Council for Sustainable Development/World Resources Institute, International dairy bodies, FAO, and ISO 14040, 14044 & 14067⁴. The FAO LEAP initiative incorporated this method into its own livestock methodology⁵ and subsequently the FAO GLEAM model. The method is continuously reviewed to reflect evolving science and standards, in addition to experiences in using it by the dairy industry.

2. Contribution of the dairy sector to global emissions

According to a joint FAO-GDP study⁶, that considered emissions from the sector over a 10-year period 2005-2015 (As opposed to the normal snap-shot study) the dairy sector was estimated to have emitted 1,711.8 million tons of CO₂ equivalent (CO₂-eq.) in 2015. GHG emissions mainly come from a combination of enteric fermentation (methane), manure management (methane and nitrous oxide), feed production, transport, and processing (carbon dioxide and nitrous oxide).

There remains a distinct difference in emission intensities between regions. In 2015, the emission intensity of milk production was lowest in developed dairy regions, ranging between 1.3 to 1.4 kg CO₂ eq./kg fat-and-protein corrected milk. In developing dairy regions such as South Asia, Sub-Saharan Africa, West Asia and North Africa emission intensities between 4.1 to 6.7 kg CO₂ eq./kg fat-and-protein corrected milk were the norm. An important finding was that all global dairy regions over this 10 year period had reduced their emissions intensity!

⁴ https://dairysustainabilityframework.org/wp-content/uploads/2016/10/IDFBulletin479-2015_Carbon-footprint.pdf

⁵ <http://www.fao.org/partnerships/leap/en/>

⁶ FAO and GDP. 2018. Climate change and the global dairy cattle sector – The role of the dairy sector in a low-carbon future. Rome. 36 pp. License: CC BY-NC-SA- 3.0 IGO <https://dairysustainabilityframework.org/wp-content/uploads/2019/01/Climate-Change-and-the-Global-Dairy-Cattle-Sector.pdf>



3. Mitigation measures

A key strategic purpose of the DSF is to reduce emissions through all economically viable mechanisms. The aforementioned FAO and GDP study identified potential mitigation measures that focus on reducing emission intensity and absolute emissions. Globally, the single most effective GHG mitigation strategy is to increase animal productivity. Enhancing animal productivity has several dimensions, including feed, reproduction, health, genetics and overall management of the animal operation (See Table I).

Table I: Potential mitigation strategies connected to productivity gain

<p><i>Feed and feeding management</i></p>	<p>Feed efficiency can be increased by optimizing energy and protein content in the feed and using precision feeding techniques to match animal requirements with dietary nutrient supply. Feed and feeding management can help reduce CH₄ and NH₃ emissions, and can be achieved through various mitigation strategies that include⁷:</p> <ul style="list-style-type: none"> ○ increasing forage quality and digestibility by harvesting forages at the right time and developing forage varieties rich in desirable nutrients; ○ increasing digestibility of feed by using concentrate feeds and starch as well as byproduct feeds with high oil contents, distiller grains and meals from the biodiesel industry; ○ accurately predicting animal degradable and undegradable protein requirements to avoid overfeeding of dietary N; ○ grass management by developing varieties with specific traits aimed at improving feed efficiency or directly reducing emissions. This may include the inclusion of legumes in grassland for grazing or silage to decrease methane production. Pasture management practices can include shortening the duration of the grazing period, removing grazing animals during conditions conducive to N₂O emissions, avoiding the development of ‘hot-spots’ for soil emission of N₂O or CH₄, and applying precision management techniques to the fertilization and utilization of pastures.
<p><i>Animal health and husbandry</i></p>	<p>Endemic cattle diseases have a negative effect on cattle production and productivity, which impacts GHG emissions intensity. Reducing the prevalence of diseases and parasites generally reduces emissions intensity as healthier animals are more productive, and thus produce lower emissions per unit of output. Using Animal Health Improvement Measures (AHIM), dairy farms can make significant contributions to reducing GHG emissions as well as bringing positive economic impacts to dairy farmers⁸. GDP and the Global Research Alliance on Agricultural Greenhouse Gases (GRA) are currently working in Chile, Kenya and the United Kingdom to explore:</p> <ul style="list-style-type: none"> – The effect of proactive animal health management on GHG emissions – The economic impact these improvements have on farmers – How AHIM could be included in Nationally Determined Contributions (NDCs) <p>The key AHIMs under study include:</p>

⁷ https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/fg18_mp_feeding_strategies_2017_en.pdf

⁸ <https://dairysustainabilityframework.org/wp-content/uploads/2019/12/GHG-Dairy-Health-Leaflet-v2.pdf>



- addressing reproductive performance through early pregnancy diagnosis; sensors and tools for heat detection and fixed-time artificial insemination programs;
- controlling single-agent infectious diseases (Bovine Viral Diarrhoea virus, BVDv) by using biosecurity measures and segregation, vaccinations, testing and removal of persistently infected (PI) animals; and
- managing multifactorial or management disease (mastitis) through teat disinfection and hygiene, dry cow therapy and milking management training.

Early results show that measures of infertility represent the most significant opportunity to reduce GHG intensity. Overall, the implementation of crucial AHIMs has considerable potential for long-term and lasting cost-effective GHG emission mitigation.

Manure management

Manure management includes measures to reduce livestock urinary nitrogen and GHG emission from livestock manure. Improved manure collection, storage and utilization can be achieved by⁹;

- using cow manure in biogas systems to reduce emissions of GHGs associated with the storage of manure;
- improving the quality of fertilizer and replacing fossil energy sources;
- switching from raw to composted manures;
- breeding animals for improved nitrogen efficiency;
- using forages that have a higher energy-to-protein ratio, and balancing high protein forages with high-energy supplements;
- manure stockpile aeration and composting; and
- adding urease inhibitors to manure stockpiles can reduce nitrous oxide emissions.

Fertilizer management

Fertilizer management can be optimized by¹⁰:

- lowering manure application rates and incorporating manure into soils to reduce emissions while maintaining farm productivity; and
- using commercial fertilizer produced in an environmentally friendly way with a low carbon footprint.

Energy use at the farm

Achieving energy efficiency on dairy farms is relatively inexpensive and can be realized by:

- reducing fossil fuel energy use (e.g., electricity and diesel); and
- increasing the use of sustainable energy, e.g., wind energy and biofuel to replace fossil energy sources.

As highlighted in the latest IPCC report on land use¹¹, reductions in the emissions intensity of livestock may lead to absolute reductions in GHG emissions, which remains the fundamental goal to achieve. Therefore, the

⁹ <https://www.agric.wa.gov.au/climate-change/managing-manure-reduce-greenhouse-gas-emissions>

¹⁰ <https://dairysustainabilityframework.org/wp-content/uploads/2019/01/Climate-Change-and-the-Global-Dairy-Cattle-Sector.pdf>

¹¹ IPCC Special Report on Land and Climate Change 2019, <https://www.ipcc.ch/srccl-report-download-page/>. “For livestock, options include better grazing land management, improved manure management, higher-quality feed, and use of breeds and genetic improvement. Different farming and pastoral systems can achieve reductions in the emissions of livestock products. Depending on the farming and pastoral systems and level of development, reductions in the emissions intensity of livestock products may lead to absolute reductions in GHG emissions.”



accelerated adoption of existing best practices and technologies to increase production efficiency should be incentivized. This is particularly true for low-and-middle-income regions where there is vast potential for increasing productivity, as well as the harnessing of synergies between food security, development objectives, and climate change mitigation and adaptation goals.

Over the past decade or so, the dairy sector has made significant progress in improving production efficiency. Between 2005 and 2015 global milk production increased by 30% in response to increased consumer demand; a level of production that would be predicted to produce a 38% increase in total GHG emissions. However, because of improvements in milk yield per cow, emissions rose by 18% over this time period. So, while total emissions have increased, dairy farming has become more efficient, resulting in declining emission intensities per unit of product

Additional measures that can reduce absolute GHG emissions in the dairy sector include enhancing carbon capture and storage in soils (though there remains a lack of an internationally recognized methodology to quantify the storage achieved) and identifying strategies to promote a circular economy. These measures entail improved grassland management, minimizing the production and waste of new and existing resources, closing of nutrient loops and extending the lifetime of those already in circulation. Further mitigation strategies can involve nutrient recovery technologies like anaerobic digestion; breaking down manure to produce nutrient-rich products that can be used to replace synthetic fertilizer and the generation of biogas that have multiple 'use' opportunities. Finally, leveraging technologies can advance the modernization of agriculture by moving to precision farming, including measures for irrigation, fertilization and precision feeding¹².

4. Dietary changes

Recently there have been calls for a dietary shift, to reduce animal-sourced foods and increase plant-based foods in our diets. However, dietary changes are not a silver bullet solution for climate change especially when considering the bigger picture. For example, much of the world's agricultural land currently used for grazing is marginal land; not suitable for growing crops in many instances. A move away from livestock production to more plant foods will not necessarily create a more productive, sustainable global food system. Further, crop production itself can, in some cases, have adverse environmental consequences such as widespread deforestation where various crops are intensively produced.

More scientific work is needed to understand the full climate and wider implications of dietary changes. Available estimates suggest that the mitigation potential of dietary change to a more plant-based diet may be overestimated. IPCC estimates that diet alteration might generate changes in a range from 2.7-6.4 GtCO₂e.yr by 2050¹³, which is significantly less than what could be achieved through the implementation of a broader set of mitigation options in agroforestry, and crop and livestock production, which could produce changes in the range of 2.3-9.6 GtCO₂e.yr by 2050¹⁴.

The impact of dietary changes on food security and nutrition must also be considered. Dietary shifts from animal-sourced food to more heavily plant-based diets such as the one suggested by the [EAT-Lancet Commission](#) and others may be unaffordable for most of the world's poor and can worsen malnutrition. An

¹²<https://dairysustainabilityframework.org/wp-content/uploads/2019/01/Climate-Change-and-the-Global-Dairy-Cattle-Sector.pdf>

¹³ IPCC 2019 op.cit.

¹⁴ IPCC 2019 op.cit.



assessment of the cost of the EAT-Lancet diet found that it was not attainable for at least 1.58 billion people – mostly in sub-Saharan Africa and south Asia¹⁵. More than 50% of the cost associated with the diet goes for fruits, vegetables, legumes and nuts. High-quality protein staples like dairy are much more affordable. The CGIAR research program on Agriculture for Nutrition and Health argues that the EAT-Lancet diet is not practical for the global south, which has high malnutrition rates and where there is need to increase consumption of nutrient dense, animal-sourced foods, especially for young children¹⁶. Further, by its own admission, the EAT-Lancet Commission indicates that adherence to their recommended diet may require the use of supplements to make up for nutritional shortfalls, a situation that may be impractical in many regions, and can further exacerbate cost and health issues.

Dietary changes should be considered as part of a holistic approach that considers not only their impacts on climate, but on food security as well. This approach should entail a consistent and broad set of mitigation options, based on the assumption that both plant-based and animal-based foods produced through sustainable systems (not just climate consideration) can help achieve climate change adaptation and mitigation.

5. Pathway to carbon zero

A further reduction in GHG emissions by the dairy sector towards the goal of net zero emissions will require adoption of a combination of actions that consider the inherent complexity of the global industry and the unique challenges of climate change¹⁷.

The most significant option remains in expanding the adoption of existing pragmatic best practices combined with the use of innovative technologies. Breakthroughs in developing new mitigation strategies must accompany further gains in production efficiency through improved feed and nutrition, animal genetics, pasture management and animal health¹⁸. A concerted effort by all stakeholders is required, as huge investments are needed to support research, promote innovation, effective knowledge transfer and provide incentives to accelerate the translation and implementation of low-carbon efficient technologies and practices. Technology and knowledge transfer efforts must also focus on bringing the least efficient farmers closer to the most efficient.

Globally, through the *NET ZERO, Pathways to Low Carbon Dairy* initiative, the dairy sector is implementing a program that will build practical guides, methodologies and cost benefit models that will help to decarbonize the global dairy sector. Significant progress is already being made towards achieving net zero or a net positive milk production footprint.

- In the UK, the agriculture sector is also working to contribute to the country's pledge of reaching net-zero carbon emissions by 2050¹⁹. While the National Farmers Union has set a net-zero goal by 2040, many farms lack the capital to invest in new technologies, tools and facilities to reduce carbon emissions. UK's Committee on Climate Change has called for a new post-Brexit farm subsidy system to promote change, estimating an "under £2bn annual" cost for land and agriculture projects to reduce emissions and store carbon. Scientists across the globe are also researching the potential of animal genetics for breeding animals that naturally emit less methane.

¹⁵ [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(19\)30447-4/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(19)30447-4/fulltext)

¹⁶ <https://a4nh.cgiar.org/2019/10/14/the-EAT-LANCET-healthy-reference-diet-perspectives-from-the-global-south/>

¹⁷ <https://dairysustainabilityframework.org/wp-content/uploads/2019/01/Climate-Change-and-the-Global-Dairy-Cattle-Sector.pdf>

¹⁸ <https://dairysustainabilityframework.org/wp-content/uploads/2019/01/Climate-Change-and-the-Global-Dairy-Cattle-Sector.pdf>

¹⁹ <https://www.ft.com/content/7d522ad8-abb4-11e9-8030-530adfa879c2>



- In the US, the Net Zero Project²⁰, which GDP is part of, is already driving the sector toward a goal of achieve carbon neutrality by 2050. With the exponential increase in scientific and technological discoveries in the US, the dairy sector there has made considerable investments in developing state of the art technologies and management practices and is establishing the technical knowledge required for voluntary reduction of the environmental footprint. The Net Zero Project is addressing the financial, technical, and political obstacles standing between the US dairy sector and carbon neutrality.
- In seven European countries, Arla Foods, a dairy cooperative of 11,000 farmers, has set an ambitious target to reduce GHG emissions by 30% per kilo of milk over the next decade, and working towards net-zero by 2050. Arla's strategies include using renewable energies, reducing waste to landfill and improving yields from dairy herds. Since 2005 Arla has seen a 22% emission reduction in emissions while increasing milk production by 40%. The cooperative is collaborating with several other dairy and beef organizations and is undertaking studies to identify the best techniques for emissions reduction and establishing the amount of carbon grazing lands store²¹.

Recommendations for the workshop on livestock

GDP encourages UNFCCC Parties to recognize the current efforts of the dairy sector in mitigating GHG emissions and adapting to climate change while working to ensure food security for a growing world population.

GDP recommends the workshop on Improved Livestock Management Systems addresses the following issues:

- Identify specific mitigation and adaptation options for livestock systems, including through case studies that can show best practices and technologies adopted by progressive sectors;
- Examine specific needs and requirements for the implementation of these adaptation and mitigation options;
- How to achieve change at scale recognizing there are 133 million dairy farmers globally
- Identify areas of improvement and potential pathways towards more resilient livestock systems that can reduce their emissions while not compromising food and nutrition security;

Among the international organizations and research institutions that could present on the above topics, GDP suggests the following:

- Global Research Alliance on Agricultural Greenhouse Gases (GRA)
- Dairy Sustainability Framework (DSF)
- Food and Agriculture Organization of the United nations (FAO)
- Global Agenda for Sustainable Livestock (GASL)
- International Livestock Research Institute (ILRI)

²⁰ <https://www.dairyindustries.com/news/32149/sustainability-project-aims-for-net-zero-climate-impact-in-us-dairy/>

²¹ <https://www.ft.com/content/7d522ad8-abb4-11e9-8030-530adfa879c2>



2 (f) Socioeconomic and food security dimensions of climate

Socio-economic and food security dimensions of climate change in the agricultural sector

Driven by population and economic growth, particularly in developing countries, the demand for livestock products is expected to expand substantially in the coming years. From an estimated 7.7 billion people worldwide in 2019, the UN estimates that the global population could grow to around 8.5 billion by 2030, 9.7 billion by 2050, and 10.9 billion in 2100²².

As we seek ways to feed a growing global population, it must be remembered that milk and dairy products are fundamental elements of a nutritious diet and contribute to good health and wellness. They also serve as an efficient way to get high quality protein into the diet. Further, by creating jobs the dairy sector supports the development of rural economies, especially in developing countries. The dairy sector is committed to contributing to social, economic and environmental sustainability as per the UN SDG's.

I. Dairy products for food security and nutrition

According to the 2018 Global Nutrition Report, malnutrition has remained a persistent and pervasive global challenge affecting all age groups and all regions around the world²³. WHO estimates that 462 million adults are underweight, while 1.9 billion are overweight or obese. In addition, about 52 million children under five years suffer from wasting²⁴. It is estimated that undernutrition accounts for approximately 45% of deaths among children under five, while overweight and obesity contribute to almost four million deaths each year. Although progress has been made to reduce these numbers it has been slow, and malnutrition remains unacceptably high. The economic consequences of malnutrition are estimated to cost society up to US\$3.5 trillion per year²⁵.

An FAO publication, "*Milk and dairy products in human nutrition*" comprehensively covers the vital role dairy plays in nutrition and food security²⁶. The publication notes that while the role of milk and dairy products in human nutrition has been questioned by some in recent years milk contains numerous nutrients, and its consumption is associated with a reduced risk of NCDs including osteoporosis, various cancers, cardiovascular diseases, and type 2 diabetes²⁷. For developing countries, where diets often lack diversity and consumption of animal-source foods may be limited, milk and dairy products play an essential role in human nutrition.

²² United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019: Highlights (ST/ESA/SER.A/423).

²³ <https://www.unicef.org/press-releases/2018-global-nutrition-report-reveals-malnutrition-unacceptably-high-and-affects>

²⁴ <https://www.who.int/nutrition/topics/world-food-day-2019-malnutrition-world-health-crisis/en/>

²⁵ <https://www.unicef.org/press-releases/2018-global-nutrition-report-reveals-malnutrition-unacceptably-high-and-affects>

²⁶ <http://www.fao.org/3/i3396e/i3396e.pdf>

²⁷ <http://www.fao.org/3/i3396e/i3396e.pdf>



Dairy foods and ingredients help to alleviate some of the major issues associated with global malnutrition²⁸:

- Milk supplies essential nutrients, including high-quality protein, vitamins and minerals required for proper growth and development throughout childhood.
- Consumption of high-quality dairy proteins, including whey proteins and milk powders, are linked to better markers of growth among malnourished children. Providing animal-sourced foods to malnourished children in the first 1,000 days of life has nutritional benefits, and dairy products are often the first and most effective choice to treat moderately malnourished children²⁹.
- Milk and milk products provide an economical source of nutrition throughout the lifespan.

A recent joint study, *Dairy's Impact on Reducing Global Hunger*, co-written by FAO, GDP, GASL and IFCN Dairy Research Network provides quantitative evidence for the potential impact dairying can have in eradicating hunger (SDG2) and the role of dairy in providing balanced, healthy, and safe nutrition³⁰. Twenty studies conducted in sub-Saharan Africa and Asia cited the relationship between dairy consumption and child growth, as well as an inverse association between cow/goat ownership and stunting³¹. The study recommends that milk markets be developed to boost not only nutritional outcomes but also to support SDG1 (End Poverty) by generating employment opportunities in many low- and middle-income countries.

It is worth noting that the dairy industry is recognized as a major factor in the realization of the UN Decade of Action on Nutrition, 2016-2025, which seeks to eliminate malnutrition in all its forms. Under action area 1– Sustainable, Resilient Food Systems for Healthy Diets, improved production, availability, accessibility and affordability of animal-sourced foods, including dairy products, is recognized as a solution that requires action³².

To further dairy's impact on food security and nutrition, GDP has initiated several programs globally. Notably, the Dairy Nourishes Africa (DNA) initiative seeks to transform the lives of people in Africa by creating long-term self-sufficient solutions to the challenges facing the continent, including resilient and enduring economies and better health and education. The initiative aims to use dairy as a catalyst for nutritional, economic and societal improvements and create opportunities for the next generation of Africans to thrive and break the cycle of poverty and hunger³³. GDP, together with other dairy partners and stakeholders, has developed an ambitious set of pilots with the goal of doubling dairy production and consumption in Tanzania to 100 liters per person per year. Achieving this goal will help to deliver improvements in the health and wellbeing of the Tanzanian population, especially children, thus reducing adverse health outcomes such as stunting and wasting¹⁹.

²⁸ <https://www.thechicagocouncil.org/blog/global-food-thought/guest-commentary-achieving-uns-sustainable-development-goals-dairy>

²⁹ <http://www.fao.org/3/ca7500en/CA7500EN.pdf>

³⁰ <http://www.fao.org/3/ca7500en/CA7500EN.pdf>, FAO, GDP and IFCN. 2020. Dairy's Impact on Reducing Global Hungry. Chicago, Illinois, USA.

³¹ <http://www.fao.org/3/ca7500en/CA7500EN.pdf>, FAO, GDP and IFCN. 2020. Dairy's Impact on Reducing Global Hungry. Chicago, Illinois, USA.

³² <http://www.fao.org/3/a-bs726e.pdf>

³³ <https://globaldairyplatform.com/wp-content/uploads/2019/06/gdp-1908-dna-brochure-pages-final-production-goal.pdf>



2. Livestock, the dairy sector, rural development and improved incomes

Dairy is a powerful part of the livelihoods of individuals, families, and communities all over the world. One billion people globally rely on the dairy sector for their livelihood³⁴. Milk and dairy products account for about 14% of global agricultural trade and the sector employs approximately 240 million people, with an estimated 60-65 percent of the income of marginal and small-scale farmers coming from dairying. The dairy industry fosters gender equity; over 37 million dairy farms are headed by females, and 80 million women are engaged in dairy farming. Worldwide, some 900 million poor people live on less than US\$1.9/day³⁵. About half of them depend directly on livestock for their livelihoods. To poor people, farm animals are a significant asset, representing both capital and, in many cases, a source of income, while at the same time being a source of high-quality nutrients³⁶. Livestock, which can be sold in times of crisis, act as household insurance.

On the farm, livestock provides draught power and soil fertilization, and rewards their owners with a wide diversity of products ranging from milk, meat and eggs, to hides, skins, leather and wool³⁷. Livestock contributes to three major pathways out of poverty by: (1) increasing resilience (2) improving smallholder and pastoral productivity and (3) increasing market participation. Dairying not only contributes a regular source of food and income, but it puts farmers in a better position to feed their families, send their children to school, provide for their family's health, and invest in their future³⁸.

Given the importance of livestock in the livelihoods of people in both developed and developing countries, sector development is regarded as a promising avenue for supporting the achievement of SDGI. GDP and FAO's *Dairy Development's Impact on Poverty Reduction* report notes that dairy provides a major pathway out of poverty and concludes, among other things³⁹ that:

- Potential for future expansion of dairy production in developing countries remains significant and, if properly directed, dairy sector development could serve as a powerful tool for reducing poverty.
- Improved dairy cow management results in substantial (46 to 600 percent) and statistically significant increases in dairy income and, where assessed, total household income. There is large potential of contributing to rural development through dairy extension activities.
- Dairy cow ownership increases the demand for farm and off-farm labor, which may be met by family members or hired labor; thus, dairy creates employment for most rural youth.
- Dairy has a role to play in poverty alleviation. Dairying not only contributes a regular source of food and income, but it puts farmers in a better position to feed their families, send their children to school, provide for their family's health, and invest in their future.
- Women empowered by dairy farming have increased income and influence over household expenditures, which boosts their social and economic capital.

³⁴ <https://www.globaldairyplatform.com/development/>

³⁵ <https://www.worldbank.org/en/topic/poverty/overview>

³⁶ http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-20032015000600063

³⁷ <http://www.fao.org/3/CA0289EN/ca0289en.pdf>

³⁸ <http://www.fao.org/3/CA0289EN/ca0289en.pdf>

³⁹ <http://www.fao.org/3/CA0289EN/ca0289en.pdf>, FAO, GDP and IFCN. 2018. Dairy Development's Impact on Poverty Reduction.

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3. Dairy sector and Sustainable Development Goals

The UN Sustainable Development Goals (SDGs) includes several priority areas relevant to agriculture and food production, including the zero-hunger target by 2030, the sustainable use of natural resources, and climate action⁴⁰. The dairy sector supports the development of methodologies for measuring the social and economic impact of dairying and how it can help deliver outcomes within the SDG framework.

The development of the Dairy Sustainability Framework (DSF) has enabled the sector to expand its focus on reporting from just climate action activities to a broader range of interconnected issues, including social and economic dimensions of sustainability⁴¹. Each of the criteria under the DSF can contribute to various targets of the SDGs. After the launch of the SDGs in 2015, Rabobank undertook a project dubbed *Dairy and the Sustainable Development Goals*, which mapped DSF criteria and associated activities against the SDGs⁴². The mapping was based on activities and programs reported by industry players in the DSF database and identified gaps in reporting social and economic dimensions of sustainability. The project concluded that there are clear links and synergies between the SDGs and DSF criteria and with its adoption the DSF could help the dairy sector measure and communicate its social and economic impacts more clearly.

*How DSF criteria contribute to the SDGs (2016)*⁴³

DSF Criteria	SDGs Supported	Activities
<i>Market development, working conditions and rural economies</i>	SDG1 'End Poverty' SDG2 'Zero Hunger' SDG4 'Quality Education' SDG5 'Gender Equality' SDG8 'Decent Work and Economic Growth'	Several dairy processors are committed to sourcing local milk, providing consumers with access to locally produced dairy and farmers with access to the market (SDG1); satisfying nutrition demands of socially vulnerable groups (SDG2), and making dairy nutrition available through food outreach programs such as school milk programs (SDG4). Economically viable dairy businesses boost rural economies (SDG8) and contribute to SDG1 through job creation, local employment preservation, professional development through workshops and trainings, best practices, and business support programs. Activities such as technological upgrading and innovation in the dairy sector contribute to SDG9. The dairy sector is

⁴⁰ <https://www.globaldairyplatform.com/sustainable-development-goals-sdgs/>

⁴¹ https://dairysustainabilityframework.org/wp-content/uploads/2016/10/Rabobank_IN574_Dairy_and_the_Sustainable_Development_Goals_Bellamy_Bogdan_Oct2016.pdf

⁴² https://dairysustainabilityframework.org/wp-content/uploads/2016/10/Rabobank_IN574_Dairy_and_the_Sustainable_Development_Goals_Bellamy_Bogdan_Oct2016.pdf

⁴³ https://dairysustainabilityframework.org/wp-content/uploads/2016/10/Rabobank_IN574_Dairy_and_the_Sustainable_Development_Goals_Bellamy_Bogdan_Oct2016.pdf



	<p>SDG9 'Industry Innovation and Infrastructure'</p> <p>SDG10 'Reduced Inequalities'</p>	<p>investing in research and development for the efficient use of resources.</p>
<i>Animal care</i>	<p>SDG2 'Zero Hunger'</p>	<p>Improving herd health increases productivity, which results in efficient milk production that leads to increased production volume and quality, thus contributing to the nutritional needs of different age and social groups. This also contributes to SDG1 as farmers can increase their incomes as they produce more milk.</p>
<i>Working conditions</i>	<p>SDG3 'Good health and wellbeing.'</p>	<p>Activities reported in the DSF address the safety of dairy farmers and dairy plant employees, including improved mental and physical health via essential healthcare services</p>
<i>Water</i>	<p>SDG6 'Clean Water and Sanitation'</p>	<p>Activities reported in the DSF include water use efficiency, recycling measures and improved water quality.</p>
<i>Animal care and GHG emissions</i>	<p>SDG7 'Affordable and Clean Energy'</p>	<p>Activities include current mitigation measures to reduce GHG emissions (feed and feed management, animal health and husbandry, manure and fertilizer management, and energy use at the farm) as described previously in this document.</p>
<i>Animal care, biodiversity, water, GHGE, soil and soil nutrients and waste</i>	<p>SDG12 'Responsible Consumption and Production'</p> <p>SDG13 'Climate Action'</p>	<p>Activities include the mitigation measures described previously that the dairy sector is currently undertaking to reduce its carbon footprint.</p>
<i>Rural economies and working conditions</i>	<p>SDG16 'Peace, Justice and Strong Institutions'</p> <p>SDG17 'Partnerships for Goals'</p>	<p>The DSF requires members to establish multi-stakeholder governance at local/regional levels and prioritize the 11 criteria according to climatic, political, social and economic circumstances/needs. One program reported in the DSF database focused on decision-making power for small-scale farmers. The dairy sector has established a wide variety of partnerships, programs and networks that provide opportunities along the value chain globally. These partnerships cover a range of issues, including farmers' professional empowerment, biodiversity maintenance,</p>



recycling and soil management, all aimed at building local capacity, creating business links and knowledge and technology exchange/transfer.

The dairy industry continues to take concrete steps to support the SDGs. In 2016, at the World Dairy Summit, the International Dairy Federation (IDF) and FAO signed the *Dairy Declaration of Rotterdam*, a commitment by the dairy sector to accept the sustainability challenge⁴⁴. In the declaration, the dairy sector agreed to take concrete action in the areas of promoting sustainability, supporting smallholders and pastoralists, building capacity, strengthening multi-stakeholder dialogue and measuring and reporting sustainability outcomes.

Recommendations for the workshop on socioeconomic and food security dimensions

GDP recommends that the workshop on Socio-Economic and Food Security Dimensions of Climate Change in the Agricultural Sector addresses the following issues:

- The interdependence of climate change and food security
- Potential strategies to improve synergies on actions to achieve SDG2 (Zero Hunger) SDG1 (End of poverty) and SDG13 (Climate action)

Among the International organizations and research institutions that could present on the above topics GDP suggests the following ones:

- Food and Agriculture Organization of the United nations (FAO)
- Global Agenda for Sustainable Livestock (GASL)
- International Livestock Research Institute (ILRI)

⁴⁴ <http://www.dairydeclaration.org/Portals/153/Dairy%20Declaration.pdf?v=1>