Discussion paper: Measuring dairy farms' overall sustainability

Introduction

SAI Platform is a food industry organization which aims to promote sustainable agriculture worldwide for the mainstream, through continuous improvement processes. Since 2002, SAI Platform has developed Principles and Practices (P&Ps) for the sustainable production of arable crops, cereals, coffee, dairy, fruit and vegetable. See http://www.saiplatform.org/ for general information about the initiative, and http://www.saiplatform.org/about_us/working_groups/dairy.html for more details about its work on dairy. SAI Platform's Working Group on Dairy is composed of ten active members:

Sarah Paterson from Fonterra and Didier Moreau are the Chair and Vice-Chair respectively.

Over the last years, the Working Group concentrated on defining sustainable dairy production and translating it into a set of P&Ps. This having been achieved, member companies thought that another layer of common work was needed to promote the implementation of sustainable dairy practices worldwide: the development of a set of SMARTI (specific, measurable, achievable, realistic, tangible and intelligent) indicators along these P&Ps – with a view to facilitate monitoring and reporting of progress at the sector level.

Objective

SAI Platform's Dairy Working Group supports the desire to identify a common list of indicators that capture the key priority areas for improving the sustainability of dairy farming. These should 1) allow farmers to monitor and report about progress in these key areas, and 2) allow the sector to communicate about progress towards sustainability.

The list of indicators therefore should be scientifically-sound but also as practical and as manageable at the farm level as possible.

This discussion paper reflects the views of dairy companies who are members of the SAI Platform's Working Group Dairy, taking into account input from several dairy stakeholder groups that participated in a "stakeholder consultation on dairy indicators" which was held in Brussels on March 30, 2010. These included farmer groups, research institutes and academia, NGOs and retailer organizations.

This Discussion Paper is intended to stimulate discussion with other actors of the dairy supply chain and interested parties, with a view to encourage organizations within the sector to work together and share information to stimulate, monitor and report about progress of the dairy value chain towards sustainability.

Main Findings

1. SAI Platform Members unanimously identified 9 key indicators for sustainable dairy production:

    1. Animal health
    2. Animal welfare
    3. Economic viability
    4. Working conditions
    5. Emissions to air
    6. Water quality
    7. Water use efficiency
    8. Soil fertility and health
    9. Biodiversity conservation

2. This is not intended to be a comprehensive list, but reflects Members' views on the key areas of priority for improving the sustainability of dairy farming. The range of indicators also reflects the belief of members that sustainability is informed by economic, social and environmental factors.

3. The following table provides a summary of the context and importance of each issue, from a dairy point of view, and also describes the key dimensions of the issue. The key dimensions indicate the key elements of an issue and provide a reference point for consideration of appropriate metrics for measuring progress against issues.

Indicator	Context and Importance	Key Dimensions
1. Animal health	Dairy animals are the foundation of dairy farming systems. Animal health has a direct influence on milk quality and in the case of zoonotic diseases on the safety of the milk for entry into the human food chain. Maintaining good animal health is important for the economic viability of dairy farms and to deliver milk with the functionality for a wide range of processing applications, which is safe for human consumption.	• Disease status • Physical wellbeing – i.e. metabolic function, and absence of injury
2. Animal welfare	The need to ensure acceptable welfare outcomes for those animals contributing to the dairy industry is widely accepted by the dairy industry and by the international community (including through the OIE guidelines on animal welfare). There is no common definition of animal welfare, but the concept of the "five freedoms" form a widely accepted set of principles or target.	• Freedom from Hunger and Thirst • Freedom from Discomfort • Freedom from Pain, Injury or Disease • Freedom to Express Normal Behaviour. • Freedom from Fear and Distress.
3.Economic viability	The sustainability of a dairy farm is not possible without the economic viability of the farm business itself. *Economic viability means that the real returns*	• Real returns (revenue after expenses, taxes and debt servicing)

	from farming operations, relative to the farm's asset value and labor inputs, are competitive with other small business, career, or investment alternatives. Economic viability requires returns for milk production and other co-products to cover expenses, taxes and debt servicing and provide a reasonable return for the farm owners and operators.	relative to asset value and labour inputs
4. Working conditions	Sustainability of the dairy industry depends upon access to a pool of labor for dairy farms, and on the support of local communities. Provision of acceptable working conditions is part of the social contract that exists between the dairy industry and surrounding communities. The concept of working conditions takes into account payment for work undertaken and the ability of the worker to balance their commitments to work and their commitments to family and community. The later concept leads to consideration of working hours, employee safety, and potential to fulfill the aspirations of people within their working lives.	• Economic return • Hours of work required • Physical and emotional safety; • Potential to fulfill aspirations
5. Emissions to air	An externality of dairy production is the release of greenhouse gases into the atmosphere. The Global Dairy Sector has made a commitment (via the Agenda for Action on Climate Change) to taking action to reduce the GHG emissions associated with dairy production (carbon, methane and nitrous oxide) in a way that is scientifically sound, socially responsible and economically viable. The need to provide sustainable nutrition for a growing global population makes the appropriate focus for emissions reduction at a per unit of production level.	• Greenhouse gas emissions (Methane, nitrous oxide and carbon) emitted per unit of milk produced • Ammonia emissions and other emissions to air as appropriate (depending on geographical importance)
6. Water quality	Water is an essential resource. On farm it is necessary for feed production, for animals to drink and for maintaining milk quality. Water is also needed for downstream dairy industry activities. And more broadly it is involved in a wide range of social and economic applications within the broader communities to which the dairy industry belongs (including providing a basic necessity for human life). The dairy industry is both a user of water, with a clear interest availability of acceptable quality water, and a producer of outputs (nutrients, biological and chemical contaminates) that are associated with	• Nutrients (nitrogen and phosphate) • Biological contaminants (effluent/milk discharge) • Chemical contaminants

	negative impacts on both ground and surface water quality.	
7. Water use efficiency	Water is an essential resource. On farm it is necessary for feed production, for animals to drink and for maintaining milk quality. Water is also needed for downstream dairy industry activities. And more broadly it is involved in a wide range of social and economic applications within the broader communities to which the dairy industry belongs (including providing a basic necessity for human life). Water use for dairy production competes with water use for a broad range of other applications, and in many instances takes place in the context of water availability constraints.	• Water used per unit of production • Relative water stress.
8. Soil fertility and health	The ability of dairy systems to produce milk rests in the ability of the soil related to these systems to continue to produce animal feed of an acceptable quality. Soil degradation, when soil deteriorates because of human activity and loses its quality and productivity, creates challenges to the ongoing provision of food supply to the global population and to the ability of the farmer to continue earning an economically viable income from that same land. Soil degradation occurs when soil loses its nutrients, or its organic matter, or when the soil structure breaks down (including as a result of erosion), or if the soil becomes toxic from pollution	• Nutrients • Organic matter • Soil structure • Toxicity • Erosion
9. Biodiversity conservation	Biodiversity conservation is the practice of protecting and preserving the abundance and variety (biodiversity) of all species, regardless of classification, ecosystems, or genetic diversity on the planet. Land use for dairy production, including for off-farm feed production, can have an impact on natural landscapes and habitats. Dairy has a role to play, alongside other land-users, in contributing to the protection high value conservation areas.	• Variety of species over time • Genetic diversity within species over time • Land-use change. • Observance of high value conservation areas.

4. Several "fundamental" sustainability issues were identified on top of the above-mentioned indicators, which Members decided were "non-negotiable rules or controls". These include:

    1. Respect for the UN and ILO Conventions on the use of child labor
    2. Ensuring that all workers are paid salaries equal to, or above the national minimum wage

3. Not cutting down any primary forests to establish new farming activities
4. Compliance with relevant health and quality standards relevant to milk production established by Codex Alimentarius and the World Organisation for Animal Health (OIE).

5. For each indicator, a range of metrics could be used, depending on the type of farming system or geographic location. Further work is needed to elaborate guidance on the selection of appropriate metrics that could be used. Proposed principles on which to base this further work are:

    a. Geographical appropriateness – Metrics should provide a fair an accurate reflection of the sustainability of a farming system within the context of varying environmental circumstance (i.e. water availability) and placement on the development curve;

    b. Avoidance of partiality – assignment of metrics for the purpose of monitoring and/or reporting overall progress on an issue should seek to take into account the full dimensions of a sustainability issue. Use of metrics to support reporting of farm sustainability should seek to recognize, and support recognition, of the multiple issues and dimensions of issues that contribute to the sustainability balance. Potential for distorted impressions of the current performance exists where multiple factors interact to inform outcomes against a single indicator issues. For example:

        i. a positive outcome from metric measurement against one of the five freedoms of animal welfare is not necessarily indicative of a positive overall outcome for animal welfare;

        ii. outcomes in one area of soil conservation or water quality may not be informative of a good overall result;

        iii. a metric for farm economic viability which does not consider both the revenue and cost sides of the ledger will not provide a balanced picture.

    At the farm level the need to avoid partiality in metrics selection, sits alongside the usefulness of targeted actions to address weaknesses and promote continuous improvement. There is a clear role here for metrics which to focus on a particular dimension of an issue.

    c. Appropriateness to audience – use of metrics should inform their selection. Metrics are most useful when they provide information to which the receiver of that information can respond. Target audiences vary in their ability to make informed responses to different metrics. For example – consumers are best able to relate to greenhouse gases associated with the production of the product they are consuming, no matter where in the supply chain that emissions arose, however farmers can respond best to the emissions generated within their farm boundary.

d. Feasibility of measurement – Metric selection should take into account the feasibility of measurement in relation to cost, minimization of additional burden upon the farm business and scientific robustness.

Next Steps

The Dairy Working Group aims to elaborate guidance on the factors relevant to the selection of metrics and examine whether it is possible to identify metrics that could be used for each indicator, along with their relative strengths and weaknesses and applicability to different farming systems and locations. The next steps envisaged to achieve this include:

1 **Receiving external (your) feedback on the 9 indicators selected, as well as the selection of metrics (for example, geographic appropriateness, avoidance of partiality, data availability and measurement practicality).**

2 **Testing and improving the list of indicators and related metrics, through practical experience gathered by the Dairy Working Group Members.**

3 **Reviewing and updating the list of indicators and metrics as time passes and sustainability issues evolve globally.**

Appendix to Discussion paper: Measuring dairy farms' overall sustainability – a first suggestion from the group

For each of the 9 indicators identified earlier, several metrics were found by the Dairy Working Group members to offer a possible satisfying balance between scientific-soundness as well as practicality and manageability at farm level:

Key sustainability indicator	**Possible metrics**
Animal health	Lameness, mastitis, fertility, longevity, %age of losses (or replacement rate), body condition score, age at replacement of the cow
Animal welfare	Stocking density of animals in barn, number of days of grazing per year with access for at least 6 hours, proportion of cows resting; calves' treatment
Economic viability	Relate net farm income to national minimum wage
Working conditions	Employee turnover, workers average salary compared to national minimum wage
Climate change	1) Best indicator if available is carbon footprint tool; 2) Energy consumption 3) Feed digestibility; 4) Milk production per cow is debated; 5) Could include calf quality for meat of calves not used for dairy replacement; 6) Carbon sequestered in grass could also be measured in pasture-based systems
Water quality	No direct access from cows to streams; buffer zones near streams
Water quantity	Volume of water used per volume of milk produced (note: need to find a way not too disadvantage those that produce their own feed and fodder – see land use) taking into account the region's hydrological stress
Soil degradation	Soil testing results (organic matter, levels of erosion); Volume of inputs per ha (incl. Manure)
Biodiversity conservation	Percentage of farm not in production