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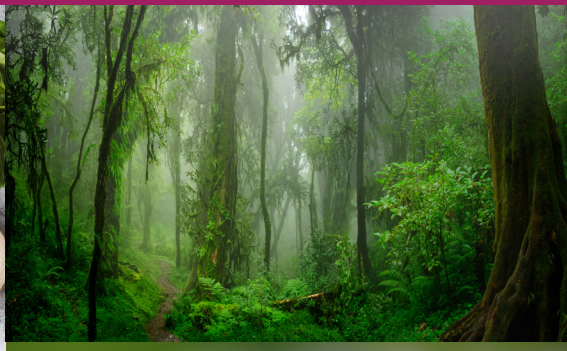
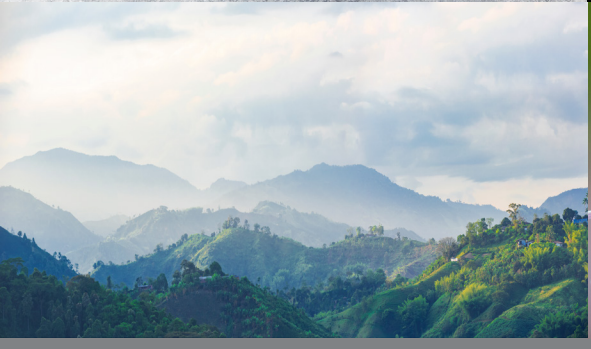
The role of standards in improving the sustainability of livestock production: current challenges and future perspectives

E.M. De Olde, Wageningen University & Research, The Netherlands; and K. McGarr-O'Brien, Wageningen University & Research, The Netherlands and Teagasc, Ireland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1 Introduction

Sustainability standards are well known for commodities such as coffee, cotton and aquaculture. Recent literature reviews on sustainability standards show the emphasis in academic literature on forestry, crop production (e.g. coffee, cotton, palm) and fisheries/aquaculture (Dietz et al., 2022, Traldi, 2021). Sustainability standards have been developed for the livestock sector in recent decades, but research in this area remains limited (De Olde and Busch, 2022).

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This can be contrasted with the substantial environmental and social impact of the livestock sector, which contributes about 56–58% of the food sector's global agricultural greenhouse gas (GHG) emissions and, given the amount of land used for livestock production, is responsible for up to 78% of terrestrial biodiversity loss in Europe (Leip et al., 2015; Poore and Nemecek, 2018). Moreover, 40% of global arable land is currently used for feed production, and one-third of the global cereal production is used for animals (Mottet et al., 2017).

Farm labour conditions, rural livelihood, public health impact and animal welfare are examples of social issues that are increasingly being raised in food supply chains. Of these issues, animal welfare is the most frequently discussed in the literature. Several recent studies have compared standards underpinning animal welfare labels and revealed a high degree of heterogeneity in requirements between different schemes (Sandøe et al., 2020, 2022; Heinola et al., 2021).

It is surprising that, despite the urgency of addressing the environmental impact and social issues related to livestock production, research and practice relating to standards in this sector is still in its infancy. Sustainability standards and programmes in livestock production are, however, now developing rapidly and continuously to address the multitude of challenges in the sector, partly in response to the high level of societal debate about livestock production and pressure from non-governmental organisations (NGOs). This trend, however, has resulted in a multiplicity of standards, with no consensus on a generic framework, making it difficult to compare standards (More et al., 2017).

As the urgency for more sustainable livestock farming practices increases, actors within the sector are increasingly looking into ways to communicate and improve the sustainability performance of their products. In this chapter, we describe current developments in standards both from the scientific literature and interviews with dairy industry actors in the Netherlands and Ireland, to shed light on where these developments might lead. We use a transition theory framework to show the current position of sustainable development in the context of livestock production standards and envision future directions for (livestock) sustainability standards.

2 Current research on livestock sustainability standards

A comprehensive insight into the role and effectiveness of certification and standards in livestock production is lacking (De Olde and Busch, 2022). For instance, livestock standards are not considered in the reporting of the United Nations Forum on Sustainability Standards and the International Trade Centre's report on the State of Sustainable Markets (UNFSS, 2022; Willer et al., 2022). Moreover, the International Trade Centre Standards Map, a comprehensive

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database of 322 standards on a wide range of sectors, does not specify standards focused on animal products such as milk, dairy or eggs (ITC, 2021).

Despite this lack of attention, there are scientific publications published on the issue. To develop an overview, a search on Scopus for articles of any date published in English related to certification or labels in relation to animal production (i.e. dairy, beef, pigs, poultry) at the farm level was carried out. Through reading the title and abstract, relevant papers were selected (i.e. those literature sources with a focus on the role and/or potential of certification, labels or standards in livestock production) and this resulted in a total of 98 publications. The publications mainly focused on specific livestock sectors including dairy (n = 39), pigs (n = 14), broiler (n = 9), laying hens (n = 7) and other (9). Twenty further publications focused on animal production in general.

Animal welfare is the most commonly discussed sustainability theme relating to certification in livestock production (n = 34). This includes studies that describe consumers' perspectives, attitudes, and willingness to pay (n = 14), studies that compare animal welfare programmes (n = 10), and other themes (e.g. focused on farmer or stakeholder perspectives, market developments, or studies describing the development of standards). While food safety, food quality and quality assurance programmes were key themes in earlier publications, e.g. Payne et al. (1999), in recent years the attention to other topics such as animal welfare, sustainability and biodiversity is becoming more prominent, e.g. Luhmann et al. (2016); Olsen et al. (2023). Organic production, as a well-known international standard, is the focus of 13 studies which describe the development of certification in different contexts, but also cover economic consequences and impact on other sustainability themes.

Overall, one-third of the publications focus on the preferences of consumers, whereas the perspective of farmers, those that must meet the criteria to be certified, is only addressed in 6 of the 98 studies e.g. van Dijk et al. (2018). While consumers ultimately must be willing to pay for a product produced under a certain standard, often associated with a price premium, it is the farmers that need to ensure they comply with the criteria of a standard. Farmers may need to invest to meet these criteria (i.e. compliance costs) or pay a fee for participation without a guarantee of these investments resulting in a viable business model (More et al., 2017). It is important to note that these extra costs, even if offset by a price premium, can limit access to those markets which have lower regulatory and/or consumer expectations (Vogeler, 2019). Moreover, the steady increase in the number of standards, as well as competition and lack of uniformity between different standards, can create an additional administrative and cost burden for farmers who are not always able to make rapid changes to meet standard requirements such as investment in improving housing systems. Luhmann et al. (2016) also found that despite the overall willingness of future-oriented dairy farmers to participate in a sustainability standard, challenges in

implementation are a topic of concern which highlights the need to involve farmers in the development and implementation of standards.

A total of 13 publications made comparisons between standards, either based on comparing the criteria put forward by each standard (n = 9), by comparing certified farms against different standards or by comparing certified farms with those that are not (n = 4). The number of studies in this last category is relatively small although these kinds of studies can potentially provide insight into the effectiveness of standards in improving on-farm conditions.

In comparing on-farm implementation of standards, it can be difficult to attribute improvements to specific initiatives (Mullan et al., 2016). Moreover, when comparing compliance scores of different welfare programmes, Stull et al. (2005) found that these differences are likely due to differences in the design of the standard, rather than differences in animal welfare levels per se. Heterogeneity in standards makes it difficult to compare standards both on paper and in terms of measurable outcomes on farms (More et al., 2017, Heinola et al., 2021). However, ways of assessing the scientific validity and effectiveness of standards are key to understanding and improving the role of standards in moving towards more sustainable modes of production.

Overall, we find that studies looking into standards in livestock production focus mainly on animal welfare and consumer perspectives. Animal welfare is seen as a key topic on which market players are trying to differentiate themselves, resulting in competition and lack of overall coherence and consistency (Vogeler, 2019; Ingenbleek et al., 2013). This competition relies on consumers being aware of and able to distinguish different standards, whilst perceptions of what constitutes good welfare may vary widely.

3 Understanding developments in dairy sustainability standards using transition theory: the sustainable market transformation model (SMTM)

The review of the literature in this area highlighted multiple challenges in the development, implementation and credibility of livestock standards, including competition and associated variability in standards and the involvement of farmers in their development. In this section, we will look in more detail at how these challenges are addressed in current developments in dairy standards and position these developments using transition theory. We go on to discuss how two sustainability standards originating from the Netherlands and Ireland are addressing these challenges.

Transition theory is a theoretical framework that describes a pathway with a number of phases, along which sectors/industries may make transitions towards increased sustainability (see, e.g. Geels and Schot, 2007). There are numerous versions of transition theory, in which multiple actors, each with

different priorities, may influence and work towards sustainable transitions (van der Minne et al., 2021). One transition theory model which is applicable to farming systems and food supply chain transitions is the 'sustainable market transformation model' (SMTM) proposed by Simons and Nijhof (2020). In the SMTM, after a 'problem' (e.g. the need for a sustainability transition) has been identified, there are four phases of transition, linked by cause and effect chains, each with its own unique characteristics and set of actors influencing transition possibilities (Fig. 1; Simons and Nijhof, 2020).

In the first phase of transition, called 'inception', actors start to recognise sustainability issues and, partly due to increased public pressure, initiate experiments, pilot projects or innovations to explore actions they can take to address and improve sustainability (Nijhof et al., 2022). In the second phase, referred to as 'competitive advantage', first movers start to recognise that their approaches from the first phase can be used to differentiate themselves and function as a competitive advantage (Tetrault Sirsly and Lamertz, 2007, Nijhof et al., 2022). Actors start to compete in the market which can result in efficiency gains and innovative solutions. Other companies may follow in response, especially when customers start to look for more sustainable products. The third phase, 'synergy', is based on the idea that actors move away from competition and start to collaborate. Collaborations can take place through platforms and in multi-stakeholder collaboration, for instance, to develop a sector strategy. Support of NGOs and governments for frontrunners is important in this phase (Nijhof et al., 2022). In the fourth phase of institutionalisation, as sustainability solutions and measures start to become the new normal, they are formalised either through top-down legislation or bottom-up industry alignment, or a combination of these. Laggards are faced with the consequences of still applying unsustainable practices and risk losing market access. Finally, while a new normal is being accepted, new sustainability issues are raised, and the first phase begins again in order to address these new concerns (Nijhof et al., 2022). In this way, the iterative SMTM framework illustrates continuous action toward identifying and improving sustainability issues.

In the following section, we describe how different initiatives in the dairy sector can be positioned within this framework.

4 Understanding developments in dairy sustainability standards using the SMTM framework: practical examples

The starting point (e.g. identified 'problem') for this transition is the widespread recognition of sustainability challenges within the dairy sector, and a need to increase dairy sustainability. In the following paragraphs, we provide examples of developments across the phases of the SMTM framework. Figure 1 illustrates

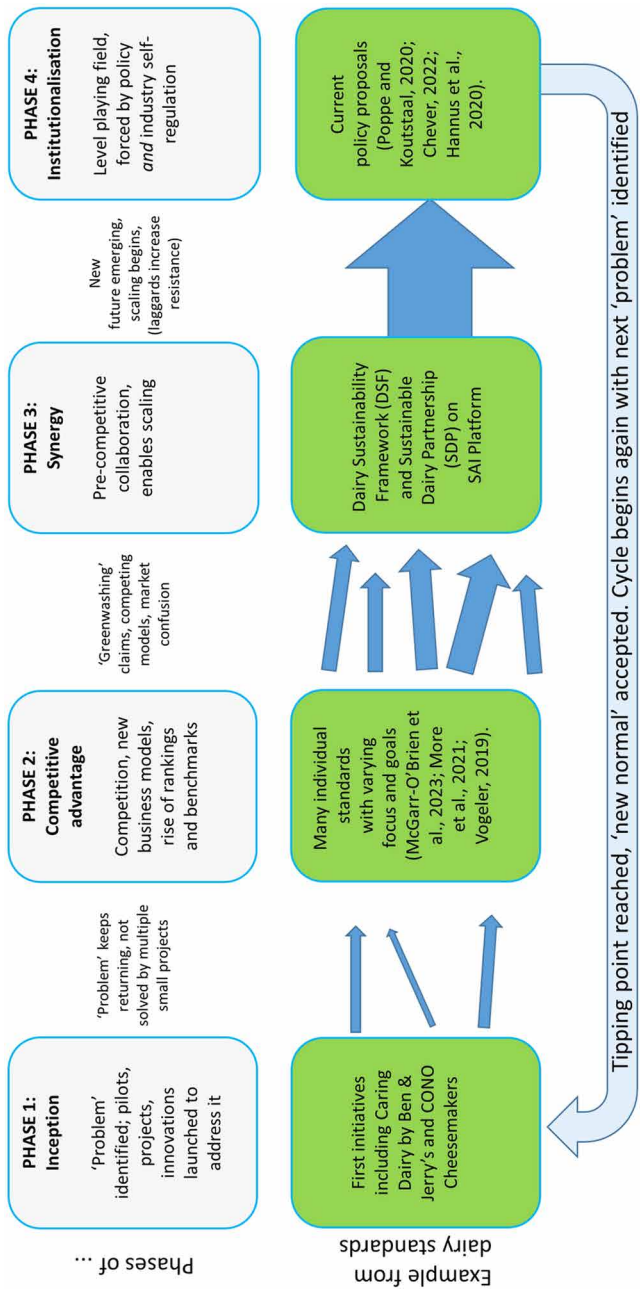

Figure 1 Phases of the sustainable market transformation model (adjusted from Simons and Nijhof (2020)), and their application to dairy sustainability standards.

the current position of the dairy sector's sustainability standards on their journey to a sustainability transition.

Caring Dairy can be seen as one of the first dairy programmes on sustainability and presents an example of an initiative from the inception phase. In 2004, ice cream maker Ben & Jerry's initiated the project for their European production operation in the Netherlands (Van Calker et al., 2005). Their aim was to ensure more sustainable dairy production and align this with Unilever's sustainable agriculture policy (Unilever bought the Ben & Jerry's brand in 2000). The project has turned into the Caring Dairy programme in which 400 dairy farmers in the Netherlands participate to improve their on-farm sustainability (Ben & Jerry's, 2023). Over time, they also recognised the value of sustainability as a marketing tool: *'Responding to stakeholder preferences not only matters for the continuity of a company but also presents market opportunities'* (Hoekstra et al., 2013, p. 197).

The second phase, characterised by competition, can be recognised by the wide variety of current standards and labels existing in the dairy sector. For example, in the study of McGarr-O'Brien et al. (2023), 19 dairy standards in Europe and North America were identified and analysed. Differences between standards can result from differences in geographical scope, sustainability focus or ambition levels. Individual retailers are also increasingly launching programmes to differentiate themselves and show consumers they are responding to sustainability concerns. In the Netherlands, for example, competition between sustainability programmes of retailers has been observed: *'… Albert Heijn made an agreement in 2017 with a private dairy processor to be able to offer 'distinguishable' milk. This resulted in the 'Better for Cow, Nature and Farmer'-milk which by now has already been available for two years. But this milk has lost its distinguishable character through the introduction of PlanetProof-milk from FrieslandCampina which has helped other retailers to make a step forward.' 'That's why Albert Heijn has to go beyond again'* (Janssen, 2020). This proliferation of standards may create confusion for consumers and potential problems of lock-in for farmers once they make on-farm changes to participate in a particular standard (McGarr-O'Brien et al, 2023).

Signs of developments towards the third phase can be recognised in different initiatives such as the development of the Dairy Sustainability Framework (DSF), linked to the Sustainable Agriculture Initiative (SAI) platform (DSF, 2023a). The DSF was created and is led by members of the dairy sector, and its members account for over 30% of global milk production. The aim is to harmonise sustainability approaches throughout the dairy sector. To that end, 11 sustainability criteria and associated indicators are included in the framework. The framework could contribute to reducing the number of individual standards and audits farmers need to comply with. The Sustainable Dairy Partnership (SDP) is a business-to-business programme

for milk processors and dairy customers that builds upon the DSF (DSF, 2023a). Members of the DSF and SDP monitor and report their progress on the 11 sustainability criteria (DSF, 2023a). Using the same criteria facilitates international comparison and reporting on the progress made along the dairy supply chain. With regard to pre-competitiveness, a representative of SDP member Danone stated: *'Through SAI platform we actually have a platform where we can have that discussion in a safe space and with a lot of honesty and transparency so we can find solutions that address everybody's needs I would say'* (SAI Platform, 2020).

Meanwhile, the first proposals to move towards the fourth phase of institutionalization are being made, especially within the European context, for instance by the Dutch Council for the Environment and Infrastructure (2019). They have advised linking public eco-scheme payments with private sustainability initiatives using performance indicators linked to a point system. They argue: *'As the management and oversight of these schemes will be in the hands of private organizations (accredited and supervised by government), implementation will be lean, bureaucracy kept to the minimum and the possibilities for synergy increased.'* (p. 2). A recent study requested by the European Parliament's Committee on Agriculture and Rural Development has recommended *'to encourage the use of relevant certifications' schemes within the CAP national strategic plans to achieve the EU sustainability objectives'* (Chever, 2022, p. 8). They also argue that each scheme should be transparently assessed in terms of their requirements and the method of implementation to prevent any risk of greenwashing. Besides greenwashing, another challenge to linking public and private sustainability schemes is whether or how comprehensively multiple sustainability objectives/criteria of, e.g. EU strategies are addressed by current standards (Chever, 2022). Although they show the challenges involved, these developments can be seen as examples of how actors are considering how institutionalization of current developments could be achieved.

Based on our insights into the development of standards in the dairy sector, we argue that current efforts are mainly focused on the second and third phase of sustainability transformation. A relatively large number of standards are developing and trying to differentiate themselves, for example by emphasising different sustainability themes or ambition levels. This competitive focus is unlikely to continue, due to pressure from the market to prove sustainability credentials, as well as proposals to align or link private livestock standards with public sustainability goals. Some livestock standards have already submitted themselves to scrutiny from national accreditation boards advising on audit and certification processes (e.g. Irish National Accreditation Board (INAB)). However, most standards remain self-governing without official regulation or any sector-wide alignment. We discuss the challenges involved in the sustainability transformation later in the chapter.

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5 How dairy sustainability standards work: two case studies

A framework such as the SMTM allows identification of key actors and the dairy sector's current trajectory towards a sustainability transition. However, to better understand the standards and how they can increase dairy sustainability, it is necessary to investigate individual standards in more detail. For example, who governs the standards, what are their specific aims, and what challenges do they face? What are the sustainability topics they address, and how is success measured? Additionally, to understand the sustainability of the sector as a whole, is there an interaction between the various stakeholders who are steering dairy sustainability and, if so, by what mechanisms and with what goals? All these considerations influence the ability of standards to improve dairy sector sustainability.

One way to explore these questions is through in-depth interviews with those involved with particular standards. Interviews were therefore undertaken with representatives of two sustainability standards:

- Origin Green in Ireland
- Foqus Planet in the Netherlands, Belgium and Germany

Further details of these standards are shown in Box 1. Results from these interviews reveal emerging developments in current dairy sustainability standards and potential future pathways. Similarities between challenges and opportunities across sectors mean it may also be possible to apply these insights to other sectors, which we discuss further in the chapter.

Box 1: Two dairy sustainability standards

Foqus planet (FrieslandCampina dairy cooperative) and Origin Green (Bord Bia, Ireland's food and drinks board) represent two large sustainability standards in which the majority of Dutch and Irish dairy farmers, respectively, participate. Utilising market-based sustainability standards is occurring in both the Netherlands and Ireland, but in different ways. In Ireland a whole-sector, top-down sustainability standard was launched for the dairy sector by the Irish Food Board, Bord Bia, in 2013. There are also additional Irish organic and private sustainability programmes for dairy production. In the Netherlands, the sustainability standards that have emerged in the dairy sector are mainly driven by individual dairy cooperatives, processors, retailers, or NGOs, without a collective approach such as that in Ireland.

Foqus planet

Foqus planet is a quality assurance and sustainable development standard of the largest Dutch dairy cooperative FrieslandCampina, which is the eighth largest global dairy cooperative. FrieslandCampina processes its own milk under a variety of brands, and also sells milk and dairy products to business customers including large brands such as Danone (FrieslandCampina, 2023b). The 9927 member dairy farms in the Netherlands, Belgium and Germany together deliver 9.5 billion kg of milk per annum (FrieslandCampina, 2023a).

Foqus planet was first introduced as a quality assurance programme for the milk being produced by FrieslandCampina's dairy farms. Within the basic Foqus planet requirements, which are mandatory for all FrieslandCampina cooperative members, there are over 200 criteria. In 2012, Foqus planet also began a sustainable development standard which runs in parallel to, but is distinct from, the quality assurance programme. In 2015, the sustainable development section was further developed from reward on effort to reward on results. The sustainable development section of Foqus planet allows farmers to develop themselves on a minimum of two out of three sustainability themes: animal health and welfare, biodiversity and climate. For these themes, eight indicators with thresholds have been developed, and farmers can earn a premium based on their performance on these indicators. In addition, there is a fourth theme on outdoor grazing for which a premium can be obtained. Through different administrative and on-farm audits, the performance of the members is checked. Moreover, there is an independent auditor checking this compliance control of FrieslandCampina. Foqus planet is reviewed and updated annually with input and permission from farmers of the FrieslandCampina cooperative, among other stakeholders (Focus Planet Representative, 2022).

Origin Green

Nearly 100% of milk sold to Irish processors is enrolled in the Origin Green sustainability programme developed and managed by the Irish Food Board, Bord Bia (Origin Green, 2022). Approximately 16 500 dairy farms participate in the standard, and membership is a precondition for farmers to supply their milk to processors in Ireland (Bord Bia, 2022). Origin Green is operationalised for dairy production by the Sustainable Dairy Assurance Scheme (SDAS) audit process, which is itself audited annually by the Irish National Accreditation Board (INAB) (Bord Bia, 2022). The SDAS audits are conducted by auditors who are self-employed but trained by Bord Bia. There are 170 criteria required by the audit.

Origin Green's dairy audit SDAS was introduced in 2013 in anticipation of the lifting of EU dairy quotas in 2015, which resulted in a 50% increase in production (NDC, 2022). This meant the need to establish a competitive advantage for Irish dairy products in the global market, based on their quality and sustainability, to support export sales.

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Today, Ireland exports approximately 90% of its dairy products (NDC, 2022). Origin Green aligns itself with 15 of 17 of the United Nations sustainable development goals (SDGs) and has been a member of the UN Global Compact since 2018 (Origin Green, 2022). SDAS has until now been operating without major updates to the first version of the standard. This is due to change, however, in the next few years with the planned introduction of a four-year cycle of reviewing and updating the standard after input from multiple stakeholders, including farmer representatives, and a new process of review by a panel of experts. Farmer input is sought prior to any changes to the SDAS audit, this includes on-farm testing of new criteria to evaluate how their assessment would be carried out in a real-world environment (Origin Green Representative, 2023).

Individual research interviews in late 2022/early 2023 with one Foqus planet and one Origin Green representative revealed common features in their collaborative, multi-stakeholder approach, and the importance of involving farmers in creating and improving standards. Each representative also addressed how the standards balance inherent trade-offs, as well as challenges the standards face. Notable challenges faced by both standards are the increasing external pressure being applied by consumers, business customers and governments for sustainability standards to continue improving, as well as increasing demands to supply proof of sustainability claims (although the specific sustainability claims are distinct to each individual standard). In the following section, we will describe these trade-offs and challenges in more detail.

5.1 Addressing trade-offs

There are inherent trade-offs in developing and implementing standards such as Origin Green and Foqus planet, where the aim is to increase sustainability across multiple sustainability topics and dimensions (e.g. social, environmental, and economic sustainability). Trade-offs include the need to make continuous improvements to standards while minimising the burden on farmers which frequent changes to standard criteria may create (De Olde et al., 2018; Bush et al., 2013). Interviewees for both Origin Green and Foqus planet provided their perspectives on the balancing act of keeping standards scientifically valid at the same time as being practical for farmers to implement.

In terms of accessibility for farmers, the Foqus planet representative described the need to keep sustainability criteria achievable for farmers, stating *'...if you want to keep dairy farmers motivated...then you should not do something that cannot be accessible to (farmers), because then of course no*

one will move.' FrieslandCampina have received feedback that farmers can feel 'bombarded' by constant and frequently changing demands. Involving farmer-owners of the cooperative in the annual review of Foqus planet was emphasized as being important. Similarly, the Origin Green representative stated that '*It needs to be a strong, robust standard, but a standard everyone can live with.*' Testing of criteria and how they would be operationalised on the farms, with farmers, was an important focus for Origin Green to ensure accessibility. Continuous improvement of standards was recognised as important by both standards, as the Origin Green representative stated, *'It's a response to regulation, legislation, it's a response to market need…we mightn't like change but change is inevitable.*'

In terms of ensuring scientific validity, both standards rely on legal requirements for some of the sustainability topics they address (e.g. food safety, animal health, animal welfare, commitments to climate targets under the Paris Agreement). The Origin Green representative mentioned it is easier to prove scientific validity on criteria that are readily quantifiable. Each indicator must be (scientifically) addressed separately, as different experts must be consulted for each (e.g. biodiversity requires ecologists, animal welfare requires veterinarians, GHG reduction requires experts in calculating carbon footprints). The Foqus planet representative noted that, even amongst experts, there is not always a consensus on the most appropriate measure, e.g. in the case of biodiversity and animal welfare indicators.

Different tools are used to verify the performance of farmers against the eight indicators in the Foqus planet scheme, including the Annual Nutrient Cycling Assessment (Van Dijk et al., 2022) and KalfOK for young stock-rearing quality (Santman-Berends et al., 2018). Although individual types of measurement can be scientifically validated, the selection of the criteria used by different schemes cannot. Criteria are included because they fit the company's strategy and react to factors such as national policy and feedback from a company's business customers and consumers.

5.2 The demand for continuous change and impact

A common feature identified by both the Foqus planet and Origin Green representatives is an acknowledgement of escalating scrutiny of their standards over the last few years. This sense of increasing pressure is coming from multiple sources, including increasing consumer awareness on livestock sustainability issues, government policy changes aimed at increasing agricultural sustainability (e.g. the Climate Action Plan in Ireland (Government of Ireland, 2023), the vision on Circular Agriculture in the Netherlands (Netherlands, 2019), and the European Farm to Fork Strategy (European Union, 2020)), and pressure from NGOs focused on sustainability issues. The Foqus planet representative stated

'We know that NGOs also have goals. Often the same goals we pursue, but differ in the way we look at the path to take to achieve the goal. Yes, we hope that there will also be appreciation for what you already do. And they do keep us on our toes. We think it is important to keep an eye on what is going on in society.'

This increased awareness of the importance of addressing sustainability issues in livestock production also translates in an increase in sustainability demands from customers: *'everyone has demands and we see more and more that these demands also increase' (Foqus Planet Representative, 2023)*. Meeting the demands of different stakeholders and customers can be challenging and can result in duplication of effort. Sustainability ambitions articulated, e.g. by consumers or NGOs can sometimes get ahead of what is feasible for farmers or supported by research. Ensuring farmers are on board when introducing changes in a standard is key, particularly in a cooperative like FrieslandCampina: *'Sometimes our members feel overwhelmed by the speed of changes and number of demands. It was not always clear to them what challenge we were facing and what goal we were pursuing and why. They wanted to be involved in finding a solution for our challenges.'* For that reason, changes in the governance were made to better involve farmers in the development and integration of new standard requirements.

One important pressure being felt by both standards is the need to 'prove' they are making a sustainable impact. This was a clear piece of feedback from Origin Green's most recent INAB audit, as they explained in reference to upcoming changes: '*…there was quite a bit of pushback in terms of the assessors saying…you're gathering a lot of info, doing a lot of assessments, doing a lot of measurements but you're not necessarily following through and saying 'do x, y, or z' on the back of that... we're quite keen that within the standard this time we're actually going to have things in there that promote more sustainable practices at farm level. And not just promote but require farmers to implement them...'* (Origin Green Representative, 2023).

Both standards are confronted with administrative challenges given the large number of farmers involved, involving both physical and administrative audits. For instance, for Origin Green, operating the SDAS audit includes over 16 500 dairy farms across Ireland.

5.3 Opportunities

An opportunity recognised by representatives of both standards is that they are making a contribution to improving sustainability, and that there is a strong social contract to use standards to continue to improve sustainability in dairy farming. The Origin Green representative stated that even 3 or 4 years ago, the momentum towards increasing sustainability was not so well-established. Now, due in part to legislation (e.g. Ireland's Climate Action Plan), as well as consumer

sentiment, the feeling towards sustainability has changed. It now feels like there is more alignment with the entire agriculture industry in Ireland traveling in the same direction. It is assumed there will therefore be less resistance from farmers to introducing changes. This sentiment was also echoed by the Foqus planet representative, where industry-wide discussions on the next best steps for standards are taking place, e.g. through participating in the SAI Platform's Sustainable Dairy Partnership (of which Origin Green is also a member) (SAI Platform, 2023).

Both interviewees emphasized the collaborative nature of their sustainability standards. The Foqus planet representative explained *'...that should be the strength of a cooperative…that you also include dairy farmers very much in the entire decision-making process and explain why it is necessary... And so, when there are valid arguments from dairy farmers, things are really being adjusted based on what dairy farmers themselves indicate.'* In the research and development stage of the standards, the Origin Green representative stated *'We look at other schemes and standards in operation [in] other countries around the world, we look at private standards, public standards. We look at what's coming back from the marketplace...'.* In doing so, developments in the perceptions of consumers and business customers are considered as well. The importance of addressing customer views was also expressed by the Foqus planet representative. For instance, they work together with their customers to benchmark standards with the Foqus planet programme. Moreover, they collaborate with customers to study the impact of certain practices (e.g. a pilot in collaboration with Barry Callebaut chocolate on the use of feed additives to reduce GHG emissions (FrieslandCampina, 2023c). Harmonising the use of indicators was also identified as key to aligning sustainability initiatives across organisations (Foqus Planet Representative, 2022).

5.4 Lessons learned

Through discussions with representatives of two large dairy sustainability standards, it was apparent that a balancing act is undertaken by both organisations (FrieslandCampina and Bord Bia). Differing demands coming from a variety of stakeholders (e.g. ease of use and benefit for farmers, validity and continuous improvement for researchers and consumers, a unique selling point for customers) provide pressures that shape the development and updating of standards. Additional insights gained from the interviews include the common experience of increasing pressure from multiple stakeholders to continually improve sustainability and to provide proof of effectiveness. Opportunities for collaboration across the sector and a desire for alignment of sustainability goals and methods were also identified and pointed to possible dairy sustainability standard development in the future.

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6 Future developments: competition versus convergence

In our analysis of developments in dairy standards, we identified several future directions for sustainability standards involving both opportunities as well as risks in moving towards a more sustainable agricultural sector. This section looks at the degree to which individual standards seek to compete with each other and the degree to which they are converging towards a common industry-wide standard

Using the SMT framework, we have argued in this chapter that current efforts in dairy standards are mainly focused on the second and third phases of transformation (i.e. competitive advantage and synergy). There may be conflicting pressures on how far individual standards focus on competition or convergence. Standards that want to be recognised for their impact, to prove their claims are not 'greenwashing' (e.g. through strong internal governance and measurement), would have an interest in progressing to phase three and establishing convergence. As an example, the CEO of FrieslandCampina argued: *'You should not want to compete on sustainability'* (Van Rossum, 2023). However, not all standards may desire to collaborate across the entire sector. Standards which are primarily driven by market demand and attempts to differentiate products may wish to continue operating within the competitive phase (phase two).

Those responsible for individual standards may need incentivisation from external sources to work in a more collaborative way with other organisations or the public sector. Sources of incentivisation could be legislation or pressure from policymakers to regulate sustainability initiatives, or a perceived benefit to participating in a sector-wide consensus defining dairy sustainability. Sustainability ranking and benchmarking are considered as supporting actions towards the third phase (Nijhof et al., 2022). An example is the Business Benchmark on Farm Animal Welfare (BBFAW) that analyses reported management practices, processes and reporting on farm animal welfare by the 150 largest food companies globally (BBFAW, 2020). In response, food companies, like Unilever, report their sustainability ratings and ranking on their website (Unilever, 2023).

While the interest to move from phase 2 to phase 3 may vary between standards, the pressure to move to a more aligned approach with some form of regulatory oversight is becoming stronger, in particular to maintain consumer confidence (More et al., 2021; Boström et al., 2015; EC, 2010). As FrieslandCampina's CEO stated in an interview: *'Because of all the labels, the consumer is not able to see the forest through the trees'* (Van Rossum, 2023). Proposals to introduce a minimum requirement for standards have therefore been made (e.g. Remkes, 2022).

In terms of convergence, both standards (Foqus planet and Origin Green) showed some degree of public–private alignment through the inclusion of both public and private goals in their programmes. Further alignment of public goals in private initiatives is seen as a way to limit the administrative burden on farmers to comply with requirements from different actors. Alignment of private standards and public policy is, however, no guarantee that farmers will be well supported. Indeed, sustainability 'front-runner' dairy farmers in the Netherlands, when interviewed, were concerned about the investments required to conform with sustainability legislation, about the risk that requirements could change from year to year, and the financial and business continuity risks involved (Engelberts et al., 2021). This instability has caused some farmers to hold negative views on how policy supports their businesses (Engelberts et al., 2021). This is also reflected in the interview with Foqus planet, where the need for a common 'dot on the horizon' (long-term vision for dairy sustainability) was emphasised. Any arrangement between public policy and private sustainability standards will need to consider the importance of long-term planning and stability for farmers, as well as the necessity of earning trust and buy-in from farmers in the process of creating and participating in the standard. In the end, the change being demanded by society and governments has to be achievable in practice by farmers and willingly implemented by them.

Moving towards convergence and ultimately institutionalisation puts pressure on the entire sector to change, as institutionalisation establishes as a new normal in which unsustainable behaviour is no longer accepted (Simons and Nijhof, 2020). Currently, we observe that some standards that already include all dairy farmers within the organisation's remit, such as every cooperative member, or all farmers within a country, as seen in the interviews with the two standard representatives in this chapter. We also recognise that there are more exclusive standards focused instead on establishing niche markets with price premiums for a segment of products, often concentrating on a specific sustainability issue (e.g. through product labels highlighting animal welfare). The starting point for both approaches is very different. For the more inclusive standards, farmer acceptance of the value of the standard and the feasibility of compliance with it key while, for the more niche exclusive approach, consumer trust and demand is critical. In the latter group, farmers are often self-selective and already align with the ambitions and values of the standard. To establish synergies between public ambitions and private standards, an inclusive approach would be needed that offers everyone the opportunity to transition towards increased sustainability. *'We can create real impact if we can elevate the entire sector and improve it.'* according to the CEO of FrieslandCampina (Van Rossum, 2023).

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7 Future developments: stability versus continuous improvement and harmonisation versus differentiation

Moving toward phase 4 would mean that sustainable practices have become embedded in institutions and have established a new normal (Simons and Nijhof, 2020). While sustainable dairy standards have not yet reached phase 4, it's also important to recognise that, even when commonly accepted sustainable practices become embedded, this might, in turn, result in the identification of new sustainability issues (Nijhof et al., 2022). As such, sustainability transformation can be regarded as a continuous process (as also indicated by the concept of sustainable development) for two main reasons. First, as Nijhof et al. (2022) argue: *'sustainable market transformation ends when the initial sustainability problem is solved or, at least, the level playing field is increased when it comes to sustainability.'* Indeed, in many cases there will not necessarily be an absolute state in which a sustainability issue is solved, but rather a relative improvement. And second, sustainability as a concept is open to many interpretations and methods of implementation, depending on the perceptions of those involved, their context and time (Bell and Morse, 2008). This suggests that which environmental, economic and social priorities are considered important, and which should be addressed in standards, varies between stakeholders and may evolve over time. For instance, as the concept of regenerative agriculture is currently gaining momentum, the importance of soil health and biodiversity are increasingly recognised as important sustainability themes to be included in standards (Schreefel et al., 2020), while other organisations have even developed specific regenerative standards, e.g. Regenerative Organic Certified (Regenerative Organic Alliance, 2023).

The development of standards will be an iterative and ongoing process. This presents challenges for everyone involved. Developers of standards will be required to include new sustainability issues, and farmers are likely to have to comply with an increasing list of criteria. This may be at odds with the stability that farmers need for long-term planning. Moreover, an increase in the comprehensiveness of standards might come at the expense of practicality of implementation by farmers (De Olde et al., 2018). A continuous proliferation of and increase in the complexity of sustainability standards might also undermine consumers' understanding of and trust in standards.

Harmonisation is seen as an important step in the alignment of standards towards becoming institutionalised. In particular, harmonisation of terminology, criteria and monitoring approaches is key, for instance, to allow comparison between standards. As early as 2010, the European Commission published guidelines for best practices in voluntary certification schemes (EC, 2010). However, these recommendations do not seem to have progressed

(More et al., 2021). While harmonisation is important, there are also some risks involved in harmonising approaches for standards. First, harmonisation does not guarantee comprehensiveness of standards. Instead, it can focus on only agreeing upon a selected set of 'usual' criteria, rather than striving for a comprehensive approach to sustainability. Second, harmonised or generic approaches may fail to address the context-specific nature of sustainability. For instance, while animal welfare is a key issue in North-West Europe, it is not the main sustainability concern in many other parts of the world (Garcia and McGlone, 2022). It's therefore important that harmonisation efforts still allow for a diversity of perspectives and context-specific values and practices.

As an example, the SAFA guidelines of the FAO, aimed at harmonising sustainability assessments in food and agriculture (FAO, 2014), require a detailed contextualisation process in order to define what would qualify as sustainable in a specific context. Sustainability is therefore defined through how it is operationalised and translated into practice. In the context of aquaculture, (Osmundsen et al., 2020) even stated: *'Sustainability indicators determine what sustainable aquaculture has come to be.'* Standards play an important role in defining what is regarded as sustainable and, in that sense have an important responsibility in recognising the values of those affected. In doing so, they will have to balance 'individual', context-specific approaches with harmonised, generic approaches (Gasso et al., 2015).

8 Future developments: measuring impact

Given the significant contribution of the livestock sector to environmental problems such as GHG emissions, those working in the industry are exploring ways to reduce their environmental impact. Large food companies such as Nestlé and Danone have formulated commitments to reduce their climate impact by 50% by 2030 and achieve net zero emissions by 2050 (Nestlé, 2023; Danone, 2023). Such commitments are then translated to their producers, putting the focus on measuring the sustainability performance of farms. This results in increased pressure on standards to provide proof of actual sustainability improvements. However, recent studies evaluating the efficacy of standards in improving sustainability showed rather mixed results (Dietz et al., 2022; Traldi, 2021; Oya et al., 2018).

To improve the reliability of standards to contribute to sustainable development, a different approach may be needed. While historically target- and practice-based indicators have been commonly used in standards (Konefal et al., 2023), a more recent shift towards including performance-based indicators can be observed (Hatanaka et al., 2022). Performance-based indicators measure the performance or impact of farming practices through direct observations, measurements or calculations. Target- and practice-based

indicators focus more on management. Target-based indicators refer to having plans or policies in place (e.g. having water use records), while practice-based indicators focus on whether certain practices or processes have been undertaken (e.g. planting flower strips or implementing seasonal grazing) (FAO, 2014). Target- and practice-based indicators are easier to check in an audit since they only require checking whether a farmer has a plan in place or can provide evidence of applying certain practices. However, the link between having a target or applying a practice and actual sustainability improvement in practice is not always clear or verifiable.

Performance-based indicators, however, often require on-farm observations and measurements over a period of time and are therefore associated with higher investment in time and costs. Additionally, variability in e.g. weather events can add complexity to the verification of a farm's performance against identified indicators. Nevertheless, performance-based indicators are perceived as more relevant as they give more insight into the performance and impacts of a farm (FAO, 2014), and can also drive continuous improvement (Hatanaka et al., 2022). Such measurements give farmers insight into what works, enabling them to make changes in their management to improve their performance (Konefal et al., 2023).

However, a shift to performance-based indicators comes with its own risks. First of all, it may require organisations to be more selective in the sustainability issues they want to address in their standards, given the associated time and cost investment involved in measurement (GlobeScan, 2022). Reports from the Dairy Sustainability Framework, e.g. show that members prioritise GHG emissions and animal care whereas water quality, on-farm waste management and working conditions receive the least priority (DSF, 2023b). Whilst focussing on measuring performance in a few priority areas is understandable, the concept of sustainable development requires an integrative approach that encompasses environmental, economic and social dimensions, as promoted by the UN's Sustainable Development Goals (SDGs). A focus on a limited set of sustainability themes could result in trade-offs, for instance, actions to improve animal welfare potentially increasing GHG emissions. As highlighted by Osmundsen et al. (2020) *'... The mutual dependence between issues and impacts in the environment, economic, culture, and governance domains needs to be highlighted in order to create solutions that are truly sustainable.'*

Second, performance-based approaches may contribute to the idea that standards can be considered as neutral or objective. Standards can help to shape what is considered as sustainable, from the selection of sustainability themes, the experts involved, what is measured, the compliance approach and the audit procedure. As formulated by Amundsen (2022): *'This idea of standards being neutral and objective derives from a technical understanding of certification, which is centred on the perception that sustainability is a technical*

outcome to be achieved.' In particular, when using performance-based indicators, there is a risk that those issues that are not easily quantified, assessed or audited are disregarded which may undermine sustainable development more broadly defined. While a shift towards performance-based approaches can help to validate and 'prove' the impact of standards, it's important to recognise that *'The use of numbers gives an illusion of certainty and precision that is often at odds with the uncertainty that characterizes many complex and multidimensional policy issues, such as sustainability …'* (Kovacic, 2018). This also holds for specific issues such as GHG emissions, where assumptions made in Life Cycle Assessments (LCAs), such as the allocation method and estimating emission factors, have an important impact on the results (Kyttä et al., 2022). Recognising the uncertainty, ambiguity and complexity involved is therefore of critical importance to ensure the validity of and trust in standards as tools for sustainable development into the future.

Ultimately, there is a difference in creating and showing impact. It is important to recognise these differences, especially as not all impacts, or everything that is valuable in terms of sustainable agriculture, can be measured. Alrøe et al. (2017) argue that, in addition to performance-based approaches such as the use of indicators and benchmarks, there are value-based approaches which *'aim at communicating and mediating sustainability values to enable coordinated and cooperative action to transform the food system'.* The development of Participatory Guarantee Systems may be regarded as an example of this approach, in which producers are certified through the active participation of stakeholders. Loconto and Hatanaka (2018) consider it as an alternative to third-party certification that is more *'democratic and hence, produces forms of sustainability that incorporate the lived experiences of people around the world'.* Such approaches enable a more local, accessible and adaptive approach in which producers and consumers are linked (Jacobi et al., 2023). Value-based approaches are regarded as better facilitating knowledge exchange and trust-building (IFOAM, 2022). Nonetheless, the benefits of value-based approaches are difficult to communicate in the market and may lack credibility (Alrøe et al., 2017). While value-based approaches may have great potential to create impact, their capacity to show and report their impact in terms of contributions to industry commitments will be challenging.

9 Conclusion

Through this chapter we have explored the role of sustainability standards in livestock production. We have applied the lens of transition theory to recognise the progress and challenges involved in this sustainability transformation. We recognise that standards are confronted with, in some situations, conflicting pathways for development, all with their own opportunities and risks. This

means that there is no ultimate solution to address these challenges, and attention to uncertainty, context specificity and inclusiveness of stakeholder perspectives is key. Standards, through their selection of issues and criteria, define what is regarded as sustainable, and which practices are implemented. As a result, standards can play an important role, in particular when aligned with public goals. This, however, also comes with great responsibility. Responsibility in being transparent about their approach, assumptions and limitations. Responsibility to keep an eye on undesirable trade-offs that may occur. And, responsibility in involving stakeholders, and especially farmers, in the development of standards for a sustainable future.

10 Where to look for further information

The following articles provide a good overview of the subject:

- McGarr-O'Brien, K., Herron, J., Shalloo, L., De Boer, I. J. M. and De Olde, E. M. 2023. Characterising sustainability standards in dairy production. *Animal* 17(7) doi: https://doi.org/10.1016/j.animal.2023.100863
- De Olde, E. M. and Busch, G. 2022. Opinion paper: Role of standards in the transformation of the livestock sector. *Animal* 16(8) doi: https://doi.org/10.1016/j.animal.2022.100588

More information on the two case study standards can be found here:

- Foqus planet by FrieslandCampina (https://www.frieslandcampina.com/owned-by-farmers/foqus-planet)
- Origin Green by Bord Bia (https://www.origingreen.ie) and the Sustainable Dairy Assurance Scheme (SDAS) (https://www.bordbia.ie/farmers-growers/get-involved/become-quality-assured/sustainable-dairy-assurance-scheme-sdas/).

Key research in this area can be found at the following organisation:

- Wageningen University & Research (www.wur.eu).

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