

The “milky ways”: emerging sustainable business models for sustainable value creation in the dairy industry

Silvia Cantele and Paola Signori

Department of Management, University of Verona, Verona, Italy

Abstract

Purpose – This study aims to analyse the components of sustainable business models (SBMs) in the dairy industry, in relation to firm-relevant organisational features (size, ownership structure and production process) and through the lenses of the business model framework and the sustainable value exchange matrix (SVEM). This contribution proposes a taxonomy of emerging SBMs and sustainable value creation in the dairy industry.

Design/methodology/approach – This research makes use of a multiple case study approach, with cases selected in collaboration with industry experts. The selected firms are highly committed to sustainability transition. Results are drawn from qualitative data obtained from in-depth interviews and secondary sources. The interpretation phases, initially based on open coding, have been enriched by applying the components of business models (BMs) frameworks and the SVEM, and the analyses have been enhanced through an additional interpretative workshop with experts.

Findings – The authors related the BMs characteristics of some typical dairy firms transitioning to sustainability, using SBM components and taxonomies emerging in the literature, based on the formalisation of sustainability practices, the scope of operations, and the degree of integration of the three dimensions of sustainable value. These findings led to the discovery of three types of SBM in this dairy industry, referred to as “Milky Ways”.

Originality/value – This paper contributes to the scant literature on sustainability in dairy firms, highlighting the different paths followed by small and medium-sized enterprises (SMEs), cooperatives and large companies in remoulding their business models towards sustainability and thus achieving sustainable value creation.

Keywords Sustainable business model, Sustainable value, Dairy industry, Business model framework, Case studies, Qualitative analysis

Paper type Research paper

1. Introduction

Agri-food businesses are experiencing challenges in their business models (BMs) that mainly arise from changes in the market and consumer preferences with regard to sustainability issues that impact farming and production processes. They are also undergoing a significant transformation in terms of food security and response to climate change (European Commission, 2021). Agri-food businesses present unique characteristics such as high attachment to the territorial values in which they are grounded, and their tendency to work in cooperatives or in supply chains made up of multiple stakeholders (Giovannetti *et al.*, 2021; Mazzarol *et al.*, 2014). The new scenario is even more challenging for small and medium-sized enterprises (SMEs). Some studies show that small firms have an advantage in pursuing radical sustainability innovation, especially when operating in networks, while larger firms



might have a fast second strategy because they are more likely to have complementary assets that enable the innovation to be absorbed into a larger market (Schaltegger and Wagner, 2011). Nonetheless, in comparison to large companies, there is barely any analysis of the specific features of the BMs of SMEs in existing literature (Miller *et al.*, 2021). Research can help practitioners to understand their BM peculiarities and provide suggestions on how to evolve these models towards more sustainable practices and value creation for different stakeholders. The transition towards sustainable BMs, particularly in the context of “traditional” agri-food businesses, is a really challenging innovation route. Agri-food industry businesses, particularly SMEs, need support in their journey towards making sustainable decisions.

This research aims to propose a taxonomy framework for sustainable business models (SBMs) and sustainable value creation, adapted for the selected context of this study. The agri-food industry includes a wide range of product categories and business types, each with its own peculiarities. The dairy industry is particularly being impeded by certain trends, such as market reduction due to changing food consumption styles (“free-from”, vegan diets, etc.) and increasing concerns about environmental impacts and animal welfare issues (Confente and Signori, 2016). Dairy chains link the actors and activities involved in delivering milk and dairy products to the final consumer, with each activity the product increases in value, and they are facing serious challenges worldwide (FAO, 2023). A dairy chain can involve production, transport, processing, packaging and storage. In Europe, milk production is expected to register yearly slowdowns of 0.5%, which stems from sustainability objectives that are forcing the industry to improve farming practices, focus on efficiency gains, and maintain higher environmental standards (European Commission, 2021). All these changes are forcing dairy firms to rethink their BMs in terms of sustainability.

This study combines relevant organisational features of the dairy industry with the components of the BM framework (Richardson, 2008) and the Sustainable Value Exchange Matrix (SVEM) (Morioka *et al.*, 2018), to classify emerging SBMs according to their level of sustainability formalisation and local/global focus. The emerging SBM is then examined in terms of sustainable value creation, encompassing the three dimensions of sustainability: environmental, social and economic. This paper presents a literature-based background of the SBM archetypes and canvases that underlie our analysis approach. The methodology section explains the collection and interpretation of cases. The findings section describes the distinct features in terms of value proposition, value creation, value delivery, and value capture. The discussion section then presents the taxonomy framework of different SBMs, to highlight the peculiar “Milky Ways”, as distinctive pathways for sustainable value creation in the dairy industry.

2. Background literature on sustainable business models (SBM)

A business model (BM) can be considered a new unit of analysis, apart from the firm and network, that systematically represents “how to do business” (Zott *et al.*, 2011). Richardson (2008) proposes a BM framework comprising three main parts: value proposition (the offering to target customers and the basic approach to competitive advantage); value creation and delivery (which include resources and capabilities, enterprise organisation, and value network, thus indicating the sources of competitive advantage); and value capture (which demonstrates how the firm generates revenue and profit).

BM innovation refers to the “designed, novel, nontrivial changes to the key elements of a firm’s business model and/or the architecture linking these elements” (Foss and Saebi, 2017, p. 201). Transition towards sustainability is among the most prominent drivers of BM innovation (Filser *et al.*, 2021; Geissdoerfer *et al.*, 2018). Earlier BM conceptualisations lacked many aspects of sustainability, such as the different dimensions of value (economic,

environmental, and social), the inclusion of all stakeholders associated with the firm, and system perspectives other than those of the firm (Bocken *et al.*, 2013). From these extensions, the BM for sustainability (BMfS) concept emerges as: (1) a company's sustainable value proposition to its customers and all other stakeholders; (2) how the company creates and delivers this value; and (3) how the company captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organisational boundaries (Schaltegger *et al.*, 2016, p. 268).

SBM has recently developed in literature as a separate field of research (Lüdeke-Freund and Dembek, 2017). Some literature reviews show that most research contributions on SBM examine tools, propose frameworks, or analyse case studies on SBM implementation (Cantele and Truzzi, 2020; Preghenella and Battistella, 2021). The examination of specific typologies and characteristics of BM may demonstrate how these models can contribute to large-scale transformation of society towards sustainability.

In their classification of SBM, Bocken *et al.* (2014) list eight SBM archetypes based on the intersection of BM frameworks (Richardson, 2008) and BM innovation types (Boons and Lüdeke-Freund, 2013). Yet another SBM classification (Lüdeke-Freund *et al.*, 2018) is based on patterns, as possible combinations of recurring problems and their solution; the patterns are defined in relation to the typologies of value creation, starting from the sustainability triangle (Kleine and Von Hauff, 2009). By incorporating sustainability into BM concepts and tools, other researchers have attempted to include the integrative elements that distinguish an SBM from its original, profit-focused version.

The BM Canvas (Osterwalder and Pigneur, 2010) is a design tool that is useful for detailing and graphically representing the BM framework. The original BM Canvas presents nine building blocks to describe how an organisation creates, delivers, and captures value. To include sustainability in the canvas, other design tools are considered, such as the Triple-Layered Business Model Canvas (Joyce and Paquin, 2016), the flourishing BM Canvas (Elkington and Upward, 2016; Hoveskog *et al.*, 2018), and the Value Triangle Business Model Canvas (Biloslavo *et al.*, 2018). The intersection of environmental, social, and economic value defines the space of sustainable value (Lüdeke-Freund *et al.*, 2020), which extends the traditional financial model of BM Canvas.

The analysis of the sustainable value is pivotal to the SVEM (Morioka *et al.*, 2018), which is a visual framework encompassing a revision of the three value components of SBM.

- (1) the value proposition, in which the offerings to the customer and the business purpose are linked with sustainable development and competitive advantage;
- (2) the value creation and delivery systems, to connect practices, resources, and capabilities to characteristic processes and functions (i.e. supply chain and logistics, operations, marketing and sales, innovation and R&D, and organisational culture and governance);
- (3) the value capture, comprising direct and cascaded value for each category of stakeholders.

The canvases and taxonomies described above are useful for tracing the transformation to SBMs. Moreover, the use of these templates for analysis could show how various businesses with different organisational features (size, ownership structure, geographical scope of operations) approach sustainability. The role of firm size in CSR and business sustainability is controversial. On one side, studies usually find that SMEs are less likely to engage in CSR initiatives, and they face higher constraints (Vázquez-Carrasco and López-Pérez, 2013): lack of time, resources, appropriate information, and support services (El Baz *et al.*, 2016; Jamali *et al.*, 2009; Roberts *et al.*, 2006), cost burden (Revell *et al.*, 2010) or difficulties in measuring the

benefits and maintaining the momentum of activities (Jenkins, 2006) or in establishing the business case (Battisti and Perry, 2011; Lee *et al.*, 2015). Most recent literature argues that SMEs face difficulties in understanding and implementing the UN Sustainable Development Goals (SDGs) (Smith *et al.*, 2022). Hörisch *et al.* (2015) analysed how company size affects the degree of knowledge and application of sustainability management tools. They found that SMEs know and apply significantly fewer tools, but company size does not influence the share of tools applied once they are known. But while some studies argue that SMEs face more constraints in applying sustainability management tools (Johnson and Schaltegger, 2016), some have argued that these constraints are not really perceived by small firms (Sweeney, 2007) and that sustainability implementation may be easier for SMEs because of their rapid decision-making process (Cantele *et al.*, 2020). Therefore, benefits and constraints can interact with drivers to define sustainability implementation in SMEs (Cantele and Zardini, 2020). Although large firms are found to be seeking legitimacy when implementing sustainability (Schaltegger and Hörisch, 2017), they tend to respond in a weaker manner to stakeholder pressure when adopting sustainability strategies (Seroka-Stolka and Fijorek, 2020).

Studying sustainability practices implementation, Brammer *et al.* (2012) distinguished between small and medium firms, arguing that medium firms perceive more benefits related to long-term finances and market position than small firms did.

The literature on SBM has sometimes used cases of SMEs to describe their sustainable (Wells, 2016) or circular (Ünal *et al.*, 2018) business models, also in relationship with their supply chain (Macchion *et al.*, 2023). Nonetheless, the literature has rarely analysed the specific features of business models (Miller *et al.*, 2021) or SBM of SMEs, or investigated if specific taxonomies of SBM characterise SMEs in contrast to large companies. Broccardo and Zicari (2020) studied a sample of wine firms and found that they governance (in particular the distinction of family and non-family firm) is a relevant feature to differentiate the role of sustainability in BM and its relationship with performance. A recent literature review indicated that different research gaps characterise the studies of sustainability in SMEs (Martins *et al.*, 2022).

Although sustainability in agri-food businesses is an emerging topic of research (Dressler and Paunović, 2020; Franceschelli *et al.*, 2018), very few studies deal with firm sustainability implementation in the dairy industry (Ciubotaru, 2022; Ghadge *et al.*, 2017; Glover *et al.*, 2014; Swaffield *et al.*, 2019), and even fewer have an SBM perspective (Fiore *et al.*, 2020) or a circular economy business model perspective (Nasution *et al.*, 2020). In light of this substantial paucity of industry-specific studies, this research aims to contribute to the SBM literature by using the BM framework (Richardson, 2008) and the SVEM (Morioka *et al.*, 2018) to describe BM components in the dairy industry in relation to their relevant organisational features (size, ownership structure, and production process) and by presenting a taxonomy of emerging SBMs and sustainable value creation. Our research questions are defined as follows.

RQ1. How are SBM components articulated in dairy firms, and how are they differentiated with respect to firm size, ownership structure, and type of production?

RQ2. What SBMs emerge and how do they contribute to sustainable value creation?

To address the second research question, the degree of formalisation of sustainability practices, the local/global focus, and the degree of integration among the three dimensions of sustainable value (environmental, social and economic) are examined.

3. Methodology

To describe and classify SBMs in the dairy industry, an explorative research approach is required—specifically, a case studies approach. This method is consistent with the purpose

of conducting “an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-life context” (Yin, 2009, p. 18). There are few case studies in business model (BM) research, making it “challenging for firms to understand how to innovate their BMs, identify and design alternatives, then assess and select the most adequate one” (Evans *et al.*, 2017, p. 598). Although recent literature on SBM incorporates case studies as a consistent method of investigation, some specific industries with their peculiarities have rarely been studied, such as the dairy industry. The multiple case-study method involves different research steps: (1) context and case selection, (2) data collection, (3) data analysis through the lens of BM and SVEM frameworks, (4) theory development and constructing meaning, (5) final validation of findings. Figure 1 depicts the research methodology process.

The Italian dairy context has been chosen for its growing economic importance and its sustainability transition. Italy is the main manufacturer of Protected Designation of Origin (PDO); with 1,500 firms active in milk processing, employing 25,000 people with a turnover of 16.7 billion euros (Assolatte, 2022). The diffusion of new food consumption styles and increasing concerns about environmental impacts and animal welfare issues have forced dairy firms to rethink their business models towards sustainability. Within this context, in search for best practices, case selection has been guided by the key business features of dairy companies that are highly committed to sustainability transition. Under the guidance of a group of experts from the local Coldiretti and Confagricoltura (the main Italian trade associations in the agribusiness sector), seven cases have been purposefully selected (Locke, 2000) to explore the different kinds of organisations operating in the dairy industry, in terms of size, ownership structure, and production process. These dairy companies, whose anonymity we maintain for reasons of privacy, produce butter, milk, yogurt, typical fresh and aged cheese, and other products like ice creams and vegetable drinks. Business owners and managers of these case studies (see Table 1) are recognised for their ability to identify industry insights and emerging themes (Coyne, 1997).

Interviews for primary data collection in this exploratory study were designed to be semi-structured to achieve better dialogue with participants and higher quality of collected data (Miles *et al.*, 2014). The interviews were open-ended conversations, and the interview protocol (Creswell *et al.*, 2007) consisted of semi-structured questions focused on: how managers approached sustainability in their core visions, strategies, and behaviours; and discussion on the types of products offered, implemented practices, and perceived challenges, in the context

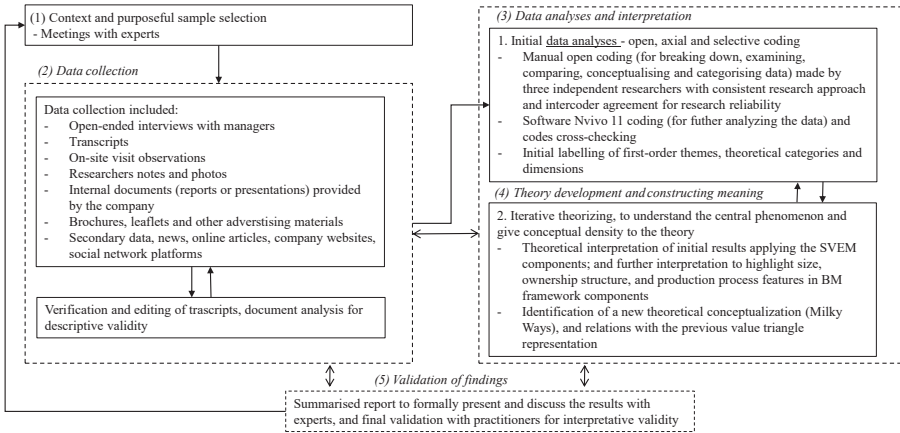


Figure 1.
Research process

Source(s): Authors’ own creation

Table 1.
The case studies

Firm	Ownership structure	Firm size	Industrial or artisanal production*	Participant's role	Interview time
A	Corporate Group	Large	Industrial, alpine, and lowland production chain	President	1 h 19 min
B	Cooperative	Large	Industrial, alpine production chain	Marketing manager	1 h 27 min
C	Cooperative	Medium	Industrial, lowland production chain	President	37 min
D	Corporate Group	Medium	Industrial, lowland production chain	Managing director	1 h 45 min
E	Cooperative	Small	Artisanal, lowland production chain	President	1 h 2 min
F	Cooperative	Small	Artisanal, lowland production chain	President	53 min
G	Family alpine farmstead	Micro	Artisanal, alpine production chain	Entrepreneur and family member	1 h 32 min

Note(s): * Examples of products: milk, yoghurt, butter, typical fresh and aged cheese, patented types of cheese

Source(s): Authors' work

of the industry and the transition to sustainability. Apart from interviews, an on-site visit was conducted for each case to collect data by observing buildings, offices, plants, and production processes. These visits lasted between two and three hours and were led mainly by the interviewees, sometimes with the support of other employees. Data from these field visits, mostly in the form of photos or notes, were collected to provide additional insights. Secondary data from desk research included content from online articles, company websites, social network platforms, and internal documents, reports, or presentations provided by interviewees. We observed that, as data collection progressed, fewer new ideas and issues emerged, reaching the “theoretical saturation” (Glaser and Strauss, 2017).

The data were interpreted through the lens of phenomenology, considering the participants' experiences and the context or situation in which they experienced them (Moustakas, 1994). The interview transcripts were analysed using content analysis methods to ensure replicable and valid inferences from the texts (Krippendorff, 2004). To process the coding, the BM framework (Richardson, 2008) and the SVEM (Morioka *et al.*, 2018) were used as references. Primary data were then triangulated with secondary data. The objective of using these frameworks proposed in the literature is to have a common basis of case comparison to discover the distinctive aspects of sustainability in the dairy industry and to identify the different SBMs related to specific organisational factors.

Data analysis was conducted in different steps (see Figure 1 for details). In the initial data analysis phase, we sequentially performed manual and software based, with NVivo 11, open coding, axial coding and selective coding to highlight concepts, categories and dimensions (Strauss and Corbin, 1990). Then, through iterative theorising, we further interpreted initial results with the lens of SVEM and BM framework components.

These analyses did not, however, clearly reveal specific characteristics of the analysed firms (size, ownership structure, and production process) as expected. Therefore, a further interpretation step was needed to filter results in terms of the firms' features displayed in Table 1. Cases needed to be grouped in three main clusters: small firms (and cooperatives) with artisanal production, medium-large cooperatives with industrial production, and medium-large corporate groups with industrial production. The highlights of the results are presented in the subsequent section with selected quotes, depicting some peculiarities of BM framework and SVEM components of dairy businesses. An example of the SVEM analysis

process (Morioka *et al.*, 2018) applied to medium and large cooperatives of our sample, is presented in Figure 2.

To ensure research trustworthiness (Lincoln and Guba, 1999), during the collection steps we verified data and editing of transcripts, document analysis for descriptive validity; during the coding phase, made by two independent researchers we kept a consistent research approach and intercoder agreement for research reliability; for further validation of findings we shared our results with experts practitioners for interpretative validity.

4. Findings

The qualitative data analyses phases enabled to conceptualise and categorise data in multiple concepts, categories and dimensions: we identified 62 first-order themes emerged from the interviews that have been traced back to 10 theoretical categories as defined by the SVEM components, and 3 theoretical dimensions, recalling the BM framework components. Table 2 summarises our data structure. Then, further interpretations to highlight size, ownership structure, and production process features in BM framework components are described in the next subsections.

4.1 Sustainable value proposition

Sustainable value proposition comprises three main elements: (1) business sustainability purpose; (2) product and service offer; and (3) customer segments, relationships, and channels. Table 3 shows the main results, along with selected quotes, to compare the value propositions of different clusters of companies in relation to the three main elements.

The business sustainability purpose of dairy firms appears to be strongly related to their size and ownership structure. Small firms have an implicit sustainability approach based on principles such as respect for natural environment and animals. In the cooperatives, sustainability means sustaining the wealth of the associated farmers. In large non-cooperatives companies, the idea of sustainability refers to the optimal combination of resources, regardless of their geographical location.

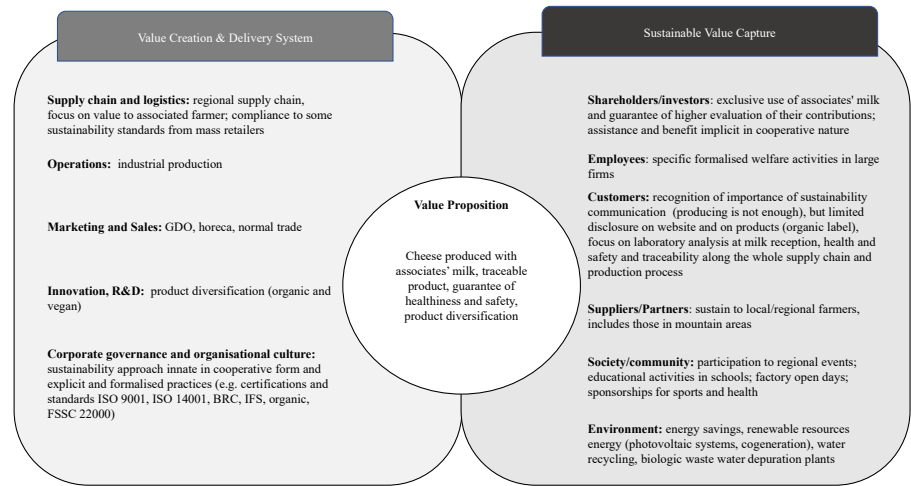


Figure 2.
Example of SVEM
analysis on medium-
large cooperatives

Source(s): Adapted from Morioka *et al.* (2018, p. 85)

First-order themes	Theoretical categories (SVEM components)	Theoretical dimensions (BM frameworks components)
Natural environment; tradition of sustaining local territory; associate farmer wealth with sustaining local/regional territory; efficient allocation of global resources and business case for sustainability	Business sustainability purpose	Sustainable value proposition
Quality; natural products; nutritional features; traceability; geographical location; health and safety standards	Product and service offer	
Product and service portfolio; product development strategies; market development strategies; market segmentation; distribution channels	Customer segments, relationships, and channels	
Traditional, artisanal, and industrial production; production traceability systems; digitalisation	Operations	Sustainable value creation and delivery
Supply-chain length; local/regional/global supply chain; supply-chain and logistics standards; farming protocols and compliance; supply-chain certification	Supply chain and logistics	
Branding strategies; communication strategies; labelling; traditional and digital communication on sustainability	Marketing, sales, and communication	
Tradition, innovation, quality, continuous improvement; research and development; laboratories; research centres; research projects	Innovation, research, and development	
Governance structure and form; code of ethics; code for listed firms; organisational compliance model; decision-making process	Corporate governance and organisational culture	
Pricing; volumes and revenue; purchasing and production costs; marketing and sales costs; bargaining power with intermediaries; economy of scale	Financial model	Sustainable value capture
Shareholder-related themes: family; farmer wealth; assistance and benefits; capital remuneration	Sustainable value captured by stakeholders	
Employee-related themes: informal attention; relationship and dialogue; welfare activities; work climate; health and safety certifications		
Customer-related themes: product quality policies; certifications; food standards; traceability; price–quality ratio		
Community-related themes: steps to protect the environment; contribution to local, regional, or international events; sponsorships for sport, health or cultural events; internships for students; open days; educational projects for schools		
Source(s): Authors' work		

Table 2.
Data structure

In small firms, product sustainability refers to the product's embedded natural side and higher sensory quality. In large cooperatives, the production process is industrial, but the focus is on the guarantee of use of milk exclusively from local farmers: the use of local product

Table 3.
Comparison of value
proposition

Value proposition	Selected quotes	Small firms/cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
Business sustainability purpose	“We are a firm with 400 daughter firms, so we have an impact on the territory. We are a firm that is sustainable starting from its legal form” (case C); “Our philosophy is related to the sustainability of supply chains: the purpose for which we exist is to give wealth to the farmers” (case B). “Here, I have a duty: making profit. Because if I don’t make a profit, in the long term, obviously, it means that I am using resources in a bad way, and I am burning wealth” (case A) “The difference is in colour: cheese produced in the alpine farmstead is yellow ... the tastes are not identical; each day has its own flavours” (case F). “People started understanding that if they buy a product that is local, this could be an advantage for everyone, because this means leaving value where we are” (case B). “We always control the milk: it is not accepted if it is not within the parameters; in case of non-compliance, it can be rejected even if it did a trip of 1,000 kilometres” (case D)	Implicit and unaware approach to sustainability; focus on nature and tradition of sustaining local territory	Innate social sustainability in cooperative form; focus on associated farmer wealth to sustain local/regional territory	Profit-driven; focus on efficient allocation of global resources and business case for sustainability
Product and service offer		High-quality natural dairy products with higher nutritional features and non-standardised characteristics	Traceable local milk, products of the territory (focus on geographic location)	Traceable global milk; high health and safety standards

(continued)

Value proposition	Selected quotes	Small firms/cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
Customer segments, relationships, and channels	"Small cheese factories, we are in the hands of the wholesalers. They appreciate the quality but don't pay enough" (case F). "The wholesalers put their own labels [on the products]". "There are few curious people, searching for excellence in cheese. But it is not easy, the new generations struggle to understand the differences between these products and the others, so you need to explain it . . . Then they understand that a cheese could be an 'elite cheese'—different from the others" (case G). "We created a new niche production with milk exclusively from an alpine farmstead. In the large-scale retail trade, the approach is completely different; it is no longer 'how much does it cost?' but 'how much do you have? Could you sell it to me exclusively?'" (case C). "We create synergies within the different companies of the group: we produce yoghurt for the entire group, and we also specialise in the production of vegetable drinks" (case D). "We became entrepreneurs again, as the product was ours; it was no longer a PDO, so we were free to create, to do whatever we wanted" (case A)	Limited range of products, specific segments, wholesaler power	Diversified products to different customer segments; different sales channels	Higher level of diversification and customer segmentation; different sales channels (own stores included)
Source(s): Authors' work				

Table 3.

sustains the local economy. In the large firms or groups, the focus is on the health and safety aspects of the products, based on rigorous and technologically advanced control procedures.

Some interesting differences emerge with regard to customer segments, relationships, and sales channels. Small firms are characterised by a limited range of products offered to a specific segment of customers. Their products are usually sold “unbranded” with only the indication of PDO. Wholesalers exercise a high degree of power over small firms; only a small portion of sales come from direct sales, wherein the firm needs to explain the production process and the unique aspects of its products to “curious people” who are potential customers. Large firms have diversified products and there is an opportunity to serve different customer segments; in large groups, each subsidiary specialises in a range of products, which can include vegetable products alongside dairy ones. The offer of differentiated high-quality products is also a success factor in relationships with large-scale retail traders. Furthermore, large firms are usually multichannel, with sales taking place through their own stores, wholesalers, and e-commerce outlets.

4.2 Sustainable value creation and delivery

Consistent with value creation and delivery SVEM components, our results reveal aspects of dairy businesses relating to key resources and activities such as operations, supply chain, innovation and research and development (R&D), marketing and sales, and organisational culture and governance. The summary of our interpretations is presented in [Table 4](#) along with selected quotes.

In small firms, the production is mainly artisanal, respecting the tradition of local handmade cheese production. To achieve artisanal production, a key resource in these firms is the master dairyman. Our cases provide evidence of the unique skills employed in this distinctive role. In large firms, the production process is industrial, with a high level of digitalisation. These firms rely on significant investment in the automation of warehouses, production lines, and quality control.

The requirement of supply-chain sustainability is particularly felt in large companies because they buy milk from different locations, even internationally. Large cooperatives share common rules among associated farmers. In small firms, the supply chain is usually short and local (or incorporated in the firm, as in the case of alpine farmsteads) and the only requirements are those specified in regulations or in the PDO consortium production protocol.

Small firms do not have a sales structure or a communication strategy and acknowledge these weaknesses. In large firms, the use of their own brands and labels is a driver for capitalising on the competitive advantage stemming from the traceability of the product.

Certifications and standards are relevant for communicating the quality and sustainability of the offerings, but the firm size also makes a difference in this area. In small firms, quality management systems and product traceability are the most prevalent types of certifications, while for large firms, environmental or health and safety certification (ISO 140001 and OHSAS, 18001) is necessary and is usually combined with multiple food-safety standards (e.g. ISO 22000, 22005, BRC Food, IFS).

The degree of emphasis on innovation and R&D activities in the firms depends on organisational structure and resource availability. In small firms, innovation mainly involves continuous improvement of quality, while respecting the traditions that characterise the production. In large cooperatives, innovation is a way to valorise some specific characteristics of milk from the associated farmers (e.g. a new organic line to valorise mountain milk). In large firms with more resources, R&D activities take place in dedicated laboratories or research centres with many employees.

For organisational culture and governance, our results reveal that large firms use compliance tools, such as a code of ethics or organisational models/codes of conduct, to

Value creation and delivery	Selected quotes	Small firms/cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
Operations	“We produce in an artisanal manner that is no longer present in large cheese factories. Our customers say, ‘Your Asiago has a different taste, when I buy it at the supermarket, I feel like I’m eating plastic’ ... the dairyman provides something different” (case F); “We need to ‘understand the milk’” (case G); “The dairyman has his experience, the smell, the colour, the touch ... something extremely visual and manual ... in large firms there is nothing like this anymore” (case E). “The link with technology is so strong that it is no longer possible to speak about sustainability without being coherent with data” (case B). “In a group context, the projects have a long perspective; we have funds for important investments. The last one was the warehouse, now we are investing in internal production lines” (case D). “We are working to install these latest generation plants, where everything is traced, and human error is no longer possible” (case C)	Traditional, artisanal production within several hours from milking; master dairyman skills	Industrial production, traceability	High level of digitalisation of production and traceability systems

(continued)

Table 4.
Comparison of value
creation and delivery

Table 4.

Value creation and delivery	Selected quotes	Small firms/cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
Supply chain and logistics	“We breed only ‘burlina’ cows and make cheese only with this milk” (case G). “I searched for this eco-sustainable supply chain. I started creating the multimedia labels of origin ... all the farmers are visible on Google Maps” (case A). “We formed a partnership with a large-scale trade retailer in Switzerland that includes specific requirements for the cowsheds. We cannot back out of it” (case C) “We don’t have a sales team ... and the name of the cooperative is written with small characters on the labels of the consortium” (case F); “No labels, we sold them without labels ... leaving the unique Asiago supply chain is risky, but we need to try to produce a cheese that is ours, so that we can make diverse marketing proposals” (case E). “The fact of creating a supply chain of traceable products gave us the opportunity to display a higher guarantee of reliability, wholesomeness and to create around this a brand that is recognised and gives protection to our farmers’ milk value” (case B)	Short local supply chain; no explicit standards except for the PDO consortium production protocol	Local/regional supply chain, exclusively from associated farmers; compliance to some sustainability standards from mass retailers	National/multinational supply chain; sustainable supply-chain certification in response to market
Marketing, sales, and communication		Consortium brands; no communication strategies except for product quality	Own brands; recognition of importance of communication (producing is not enough); but limited disclosure on website and on products	Own brands with specific labels on products (organic, water footprint, multimedia traceability); sustainability section on website

(continued)

Value creation and delivery	Selected quotes	Small firms/cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
Innovation, R&D	"Carrying on the tradition of the dairyman is his grandson who, with the love of animals and the secrets of his grandparents and father, continues to make high-quality cheese" (case G). "We are always looking for technological and managerial solutions and innovations useful for improving production processes" (case B)	Focus on tradition; limited innovation in relation to continuous quality improvement	R&D for diversified and niche products (mountain, organic, cave cheese) to valorise different partners' milk products	R&D laboratories; science and nutrition centres; published research on corporate website
Corporate governance and organisational culture	"Therefore, relations with stakeholders, at all levels, must be marked by criteria and behaviours of fairness, cooperation, loyalty, and mutual respect" (case D). "We make decisions in the family while having dinner" (case G)	Simplified governance structure (based on legal form); informal decision-making process	Cooperative form; code of ethics; organisational compliance model	Group governance; code of ethics; organisational compliance model corporate governance code for listed firms
Source(s): Authors' work				

Table 4.

adhere to governance regulations. The cooperative form involves a longer decision-making process because of the large number of associated partners who are responsible for taking important decisions together in meetings. In small firms, the governance is simple, depending on the legal form, and some decisions can even be made informally.

4.3 Sustainable value capture

In traditional BM conceptualisation, value capture is limited to the financial model of the firm—i.e. the description of the revenue streams and cost structure. In SVEM, value capture is dedicated to stakeholder relationships to highlight how the firm creates value for the environment and all its relevant constituencies. Our findings for value capture (see [Table 5](#)) have been further interpreted by experts in a preliminary results presentation workshop.

Differences among firms emerge in terms of the relevance given to the various stakeholder categories and the level of formalisation of social and environmental practices.

In small firms, human resources management is flexible, less formalised, and based on case-specific needs of employees. As firm size increases, some firm-specific welfare or human resources practices are implemented, such as free medical assistance, internal communication/magazines, continuing education, senior employee awards, hiring of disabled people, providing school or university internships, and economic incentives for employees becoming parents.

The same differentiation between implicit and formalised sustainability practices is found for environmental initiatives. In small firms, respect for the environment is implicitly demonstrated through the genuineness of the processes and with the safeguarding of territories, especially mountain territories. In large firms, the range of environmental practices increases and includes energy savings, energy obtained from renewable resources (photovoltaic systems, cogeneration), water recycling, circular economy for waste materials, and some specific certifications, particularly for large groups.

In all the analysed cases, the community is deemed to be one of the most important stakeholder categories. Small firms participate in events such as transhumance fairs or community days, where the public can witness traditional cheese production processes and sample the products. Large cooperatives also engage in sponsorships for sport events and funding for local hospitals or research institutions. Large global companies have higher financial resources that can be dedicated to cultural activities not strictly related to dairy products (e.g. encouraging art and music). Both kinds of large firms are engaged in initiatives dedicated to the dissemination of the culture of milk and its derivatives in schools or community debates.

4.4 Emerging SBMs and sustainable value creation

The cross-case result interpretation with the BM framework and SVEM model outlines three emerging aspects that further differentiate dairy sustainability approaches: first, the level of formalisation in sustainability practices, which ranges from implicit sustainability to the implementation of standards and certifications; second, the local or global focus, which defines the geographical range of sustainability impacts and value exchanges; third, the level of development of each of the sustainability dimensions, which defines the sustainable value creation. In [Table 6](#), these insights are categorised by size, ownership structure, and production process of firms.

The combination of the first two characteristics (sustainability formalisation and local/global focus) leads to a taxonomy of different typologies of SBMs in the dairy industry, while the three sustainability dimensions define the three types of positioning of these SBMs typologies in terms of sustainable value creation. We named these three emerging SBMs “Milky Ways”, as they reflect peculiar SBM typologies found in the dairy industry. To carry

	Small firms/cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
<i>Value capture</i>			
<i>Financial model</i>	High prices; high direct production costs; low volumes; no marketing and sales cost	High purchase costs (to the associate farmer); limited bargaining power with wholesaler; limited marketing and sales costs	High volume; price diversification; economy of scale; lower purchasing costs (global supplies); marketing and sales costs
<i>Sustainable value captured by stakeholder</i>			
Shareholders	Focus on family and associated farmer wealth	Associated farmer wealth; assistance and benefit implicit in cooperative nature (e.g. technical assistance, access to better conditions for bank loans)	Classic perspective of capital remuneration
Employees	Informal attention to employees; direct relationship and dialogue	Specific formalised welfare activities	Specific formalised welfare activities; attention to work climate; health and safety certifications
Customers	Product quality policies; origin certificates	Quality certifications; some food standards, traceability, and organic certifications	Price-quality ratio; quality certifications; food standards; traceability; specific segments product certification (vegetarian, halal, etc.)
Community	Mountain region development against abandonment of traditional activities; contribution to local events with products offered to the community	Contribution to regional events; sponsorships for sports and health; educational projects for schools	Contribution to national and international events; sponsorship for cultural events; internships for students; open factory days
Supplier/partners	Sustaining local associated farmers	Sustaining local/regional farmers	Eco-sustainable global supply chain
Environment	Implicit respect in mountain or traditional farming; no formalised practices	Specific initiatives: energy savings, renewable resources energy (photovoltaic systems, cogeneration), water recycling, biological wastewater depuration plant	Advanced environmental policies: green design of production plants; water footprint and environmental certifications; circular economy on waste products; sewage plants; flood retention basin

Source(s): Authors' work

Table 5.
Comparison of value
capture

out this interpretation phase, the SBM taxonomy and the sustainable value creation positioning have been discussed in a national workshop for practitioners and experts in food sustainability, in order to enhance the validity of our insights on the definition of unique “Milky Ways”—i.e. the SBMs peculiar to the dairy context. These three typologies can be “authenticity-based”; supply-integrity-based” or “market-driven-based”, and their descriptions are the following.

- (1) The “authenticity-based” SBM typology: This emphasises the sustainability that is implicitly present in the values of the entrepreneur—i.e. the values of artisanal production and preserving old methods of production. An example of strategic

Table 6.
Classification of
the cases

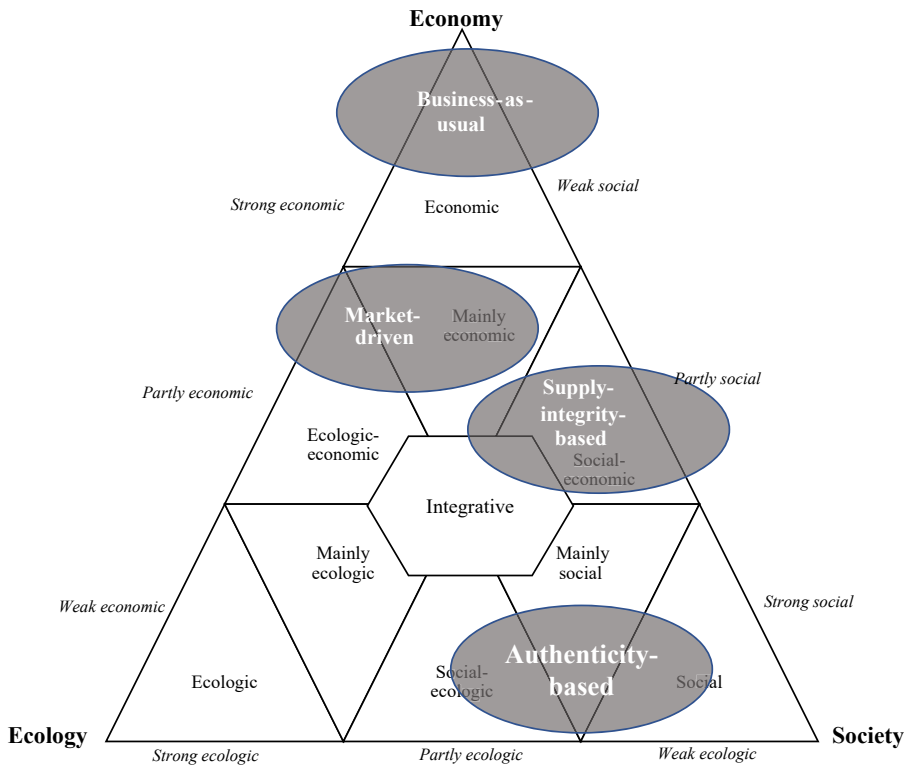
	Small firms/ cooperatives, artisanal production	Medium/large cooperatives, industrial production	Medium/large corporate groups, industrial production
Sustainability formalisation	Low	Medium/high	High
Local/global focus	Local	Regional	National/international
<i>Sustainable value creation (across the three sustainability dimensions)</i>			
- Economic	Low	Medium/high	High
- Environmental	Medium	Medium	High
- Social	High	High	Medium
Source(s): Authors' work			

positioning pertains to the concepts of “sustainability and tradition”. This SBM is found in small and micro firms that have a local scope and a low level of formalisation in sustainability strategies, as sustainability is implicit in their way of conducting business.

- (2) The “supply-integrity-based” SBM typology: This highlights the importance of ethics in the supply chain, which includes environmental respect and ensuring equity in the economic development of all the actors in the value stream. This SBM is especially appropriate for cooperative firms that have a local or regional scope and a medium level of formalisation of sustainability strategies (e.g. common social and environmental rules followed by the associated farmers while conducting their business and a fair refund guaranteed for their milk supplies). An example of positioning statement is “sustainability and territory”.
- (3) The “market-driven” SBM typology: This typology bases its legitimacy on satisfying the market expectations regarding sustainability. The businesses operating according to this identified SBM are open to product diversification and give importance to the environmental and economic sustainability of production processes. Thus, this SBM is based on innovation (more than the other two types of BM) and technological advancement. This SBM is found in non-cooperative medium/large companies with more complex ownership structure and governance. These businesses operate beyond the local territory and with a higher degree of formalisation in their sustainability strategies because of their openness to the market, diversification of capital structure, and relationship with global supply chains. Related positioning concepts are “sustainability and technology”.

We then theoretically reviewed the “Milky Ways”, emerged from our study as peculiar way of doing sustainable business in the dairy industry, within the value triangle proposed by [Kleine and Von Hauff \(2009\)](#) and revised by [Lüdeke-Freund et al. \(2018\)](#). In [Figure 3](#), in the value triangle each corner represents one of the dimensions of sustainability – ecology, economy, and society – that has maximum intensity in the corner; the further the distance of the field from a corner, the less the field is associated. A strong association indicates a business model dominated by a single dimension; a partial association implies that the business is influenced by multiple dimensions; a weak association indicates a business exhibiting little influence from one corresponding dimension ([Kleine and Von Hauff, 2009](#)).

[Figure 3](#) highlights that in “market-driven” sustainability typology, economic and environmental values are both relevant (with a slightly prevalence of economic value), while the social value has an average level of relevance. In the “supply-integrity-based” approaches,



Source(s): Adapted from Kleine and Hauff (2009, p. 523) and LüdekeFreund *et al.* (2018, p. 150)

Figure 3.
Different sustainable
value contributions in
the dairy SBMs

sustainability focuses mainly on social and economic values, and to a moderate degree on environmental value. In the “authenticity-based” model, sustainability embraces higher-level social (and partially environmental) value and is less concerned with economic sustainability. A “business-as-usual” BM, standing alone in the economic corner, is added in the figure to highlight the paths covered from this initial stage by more sustainable BMs emerging from the analysis. The visual representation of SBMs in the value triangle depicts the higher or lower degree of integration of sustainability dimensions and defines their strategic positioning for sustainable development, which should be the ultimate goal of every SBM.

5. Discussion

The analysed case studies have been selected to ensure representation of the different types of firms operating in the dairy industry. The analysis reveals that size, ownership structure, and type of production are related to the distinctive elements in the firms’ BM frameworks, thus answering RQ1 (*How are SBM components articulated in dairy firms, and how are they differentiated with respect to firm size, ownership structure, and type of production?*).

In particular, the size of the firm impacts the degree of implementation of sustainability practices and thus differentiates value creation and delivery elements. The type of production

mainly affects the value proposition: aspects of naturalness, differentiation of taste, traditional production practices, and artisanship prevail in artisanal companies, while health, safety, and traceability according to third-party standards characterise industrial production. The ownership structure mostly impacts the value capture: cooperatives, unlike other kinds of firms, deem associated farmers as a high-priority stakeholder category.

These findings confirm some aspects already found in the previous literature on CSR and sustainability in SMEs, in particular the implicit and “silent” approach to sustainability that characterise SMEs (Lee *et al.*, 2015; Vázquez-Carrasco and Lopez Perez, 2013), that is the tendency to implement practices that are less structured, informal and non-systematic (El Baz *et al.*, 2016; Jamali *et al.*, 2009; Jenkins, 2006). Some difficulties and constraints emerged in terms of adoption of certifications and standards and in terms of relationships with the distribution channel (Glover *et al.*, 2014), due to reduced power, cost burden and resource availability of small businesses (El Baz *et al.*, 2016; Jamali *et al.*, 2009; Roberts *et al.*, 2006). Besides of these confirmation evidence, this study introduced new insights because it analyses the effects of these peculiarities applied to a specific context of agri-food (dairy) industry, but also give more details on each specific BM components (value proposition, value creation and delivery, value capture). The intersection of size with ownership structure and production process is also highlighted, giving a wider breadth to the more consolidated debate of SMEs versus large companies. The peculiar concept of sustainability in dairy cooperatives is an example of these further insights that integrate what already found in the very scant literature (Fiore *et al.*, 2020).

In response to RQ2 (*What SBMs emerge and how do they contribute to sustainable value creation?*), our analyses depicted three SBM typologies with peculiar elements of differentiation: the sustainability formalisation level, the local or global focus, and the sustainable value creation, based on the different dimensions of sustainability (environmental, economic and social). To the best of our knowledge, this is the first research applying tools like the BM framework, the SVEM and the value triangle to the specific context of dairy firms; previous literature was mainly focused on wine business BM canvas (Broccardo and Zicari, 2020) or strategic business models (Dressler and Paunović, 2020) or afforded some aspects of agri-food sustainability, in terms for example of supply chain (Ciubotaru, 2022; Ghadge *et al.*, 2017; Glover *et al.*, 2014), BM innovation of start-ups (Franceschelli *et al.*, 2018) and sustainable rural development (Swaffield *et al.*, 2019).

6. Conclusion

This study contributes to the scientific debate on SBM by defining certain emerging approaches of sustainable businesses in the dairy industry in relation to relevant organisational features. Specifically, the study presents a tailored analysis of a relevant but so far underexplored industry. Although based on dairy businesses, the emerging interpretative framework appears to be applicable to other food business where the same organisational features (size, ownership, production process) are relevant in differentiating the existing BM. Further, the SBM matrix used to identify SBM typologies and classify the case studies has a cross-cutting applicability, as it highlights some common aspects characterising the sustainability approach of the different BMs and their contributions to sustainable value. In replying to our research questions, we highlighted that the analysed organisational features impact on all the three components of BM: value proposition, value creation and delivery and value capture. Further, the deeper analysis of SBM suggested by the SVEM led to the identification of SBM typologies and sustainable value creation classification. The contribution is not limited to the dairy SBM classification in itself but rather resides on the process of analysis (BM framework – SVEM – SBM typologies and sustainable value contribution) that can be replied in further studies and different industries.

From a managerial perspective, the proposed sustainable business model (SBM) taxonomy can assist managers by highlighting some business characteristics that could influence their sustainability implementation. These insights can help practitioners to understand their business model (BM) peculiarities and provide suggestions on how to evolve these models towards more sustainable practices and value creation for different stakeholders. The transition towards sustainable BMs, particularly in the context of “traditional” agri-food businesses, is a really challenging innovation route. These insights provide knowledge about consistent approaches and highlight the limitations of each model in assisting dairy firms to move towards a more holistic and integrative sustainable business. In particular, the taxonomy highlighted that a “one size fits all” approach is not applicable neither desirable; SMEs and cooperative firms are different from large and family or multinational firms, and some presumed sustainability constraints referred to small businesses may derive from a wrong conception of them as “little big firm”. This consideration opens to contribution of this study towards the society at large: considering that SMEs are prevailing in all countries and significantly contribute to their economic wealth and employment, understanding that their business models can be effectively innovated to improve their social and environmental impacts is pivotal in the path towards sustainable development goals. In particular, ensuring sustainable production patterns, encouraging companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle is an important Sustainable Development Goal (SDG target 12.6). However, there are different pathways to reach these goals, and they might be industry specific. This study, depicting three Sustainable Business Model typologies in the dairy industry, highlights peculiar elements of differentiation: the sustainability formalisation level, the local or global focus, and the sustainable value creation, based on the different dimensions of sustainability (environmental, economic and social). As such, SMEs are not neglecting their impacts or are less engaged in SDGs: they only need implementation routes that are consistent with their BM peculiarities.

The limitations of the study include the selection of a specific industry context and the small sample of cases. However, the limited number of examined cases is counterbalanced by the depth of analyses and the variety of data collected. Due to the limited number of cases studied, some further potential aspects were not deepened: for example, the differences within SMEs, as some studies recently started arguing that micro, small and medium businesses are very different clusters that the generic term “SMEs” tend to flatten, neglecting their heterogeneity (Miller *et al.*, 2021). Ownership and governance structure are further aspects that have been considered in a limited manner in this study: only the peculiarities of the cooperative form have been underlined, while further relevant aspects could be relating to family or non-family ownership, the belonging of a corporate group or the fact of having the shares listed in a stock market.

Further studies should extend the data collection and analysis to different countries or regions, as well as to other food industry contexts, and extend the field of analysis to different categories of SMEs and ownership and governance structure, in order to increase knowledge about the transition towards SBM in a sector that heavily impacts sustainable development achievement. It might also be interesting to study the processes and drivers of change in business models, re-reading sustainability as an element of transition or transformation of corporate identity. Moreover, future research could collect more information on sustainable projects, thus providing a collection of examples of sustainable actions with suggestions for replication.

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Corresponding author

Silvia Cantele can be contacted at: silvia.cantele@univr.it

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