



Achievements and challenges of innovation co-production support initiatives in the Australian and Dutch dairy sectors: A comparative study

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ABSTRACT

Policymakers and innovation scholars share an increasing interest in how to operationalize innovation support given the increasing number and range of stakeholders engaged in co-producing innovation. Using comparative case study analysis, this article examines support initiatives for dairy sector innovation in The Netherlands and Australia, addressing common challenges such as environmental issues, cattle health, new technology, and human resources. To this end, a review was conducted of documented information and articles published on the initiatives. The qualitative analysis focused on how the co-production process was supported and the achievements and challenges associated with each case. Across both countries and between different initiatives, the main achievements were found to be the generation of very different ideas addressing dairy sector challenges and attempting to bridge public and private sector interests. The main challenges included maintaining effort and momentum for high ambition targets and the potential for duplication as stakeholders became enrolled in different initiatives sponsored by different organizations in an increasingly devolved institutional setting. Furthermore, without strong institutional support for innovation co-production processes, individual actors were less able to operate effectively in innovation co-production roles. It is concluded that dairy sector innovation policies should address institutional constraints (e.g. provision of leadership and rewards for involvement in co-production processes), recognize that facilitation of innovation co-production needs to be adequately resourced, enhance support for initiative coordination to avoid duplication of effort, and take into account the specific institutional setting of countries and sectors to guide the design of innovation co-production support initiatives.

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Introduction

The dairy sector worldwide is dealing with multiple challenges such as animal health and welfare, food safety, sustainable land management, climate change, and liberalizing markets, requiring the sector to be continuously innovative (Creamer et al., 2002; Demeter et al., 2009) in terms of production methods, business arrangements, and marketing concepts. To address these challenges, innovation thus means not only technology production, but also changing institutional and organizational arrangements such as market structure, supply chains, labor organization, or land tenure (Leeuwis, 2004). Dairy sector innovation comprises farm-level entrepreneurship and innovativeness, adaptations in the dairy value chain, and different forms of support from service providers and organizations such as agribusiness, extension, and research (Bergevoet and van Woerkum, 2006; Creamer et al., 2002; Teixeira

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et al., 2004). Innovation is increasingly considered as a process of co-production (Hartwich and Negro, 2010; Jasanoff, 2004) whereby actors along a value chain or working in a particular domain of interest interact, co-operate, and co-ordinate their activities to generate new knowledge, technologies, and practices for desired change. Such innovation co-production has been captured in several approaches: an open innovation model has been described from the management science domain (see e.g. Chesbrough, 2003; Elmquist et al., 2009) and, within the agricultural domain, the agricultural innovation system (AIS) approach has been developed (Devaux et al., 2009; Klerkx et al., 2012; Sumberg, 2005). Co-production approaches to innovation do not imply that earlier more linear approaches to innovation should be fully rejected as these have generated great improvements. However, it has been indicated that, especially for more complex innovations which require a reordering of production systems and value chains, co-innovation approaches are better capable of fostering the multiple changes which are needed (Klerkx et al., 2012; Hounkonnou et al., 2012).

A central element of enacting or operationalizing innovation co-production through an AIS or open innovation model is stimulating

effective linkages and collaboration between heterogeneous actors in regions, sectors, and value chains (Devaux et al., 2009; Klerkx and Leeuwis, 2008). However, this does not come without implementation challenges including: aligning different mindsets and competencies of the people involved; creating adequate institutional incentives for linkage building and collaboration; and changing research, extension, and innovation agenda-setting and funding mechanisms to enable innovation co-production (Crawford et al., 2007; Klerkx and Leeuwis, 2009a; Snapp et al., 2003). Similar constraints to innovation co-production have been recognized for dairy sector innovation. In that sector, conceptual work has been undertaken to develop proposals for innovation co-production (Jiggins, 2001; van Dijk and van Boekel, 2001), and some empirical work has been done assessing projects designed to stimulate innovation co-production in the dairy sector (e.g. Metzger, 2008; Vaarst et al., 2007). However, there has been no systematic international comparison and sector-wide stocktaking of initiatives aimed at supporting innovation co-production in the dairy sector. Without such analysis, it is difficult for policymakers and investors in innovation support to gauge whether particular support initiatives may work better in some situations than others, and as Klerkx et al. (2009) have noted, it is still an open question how to shape co-innovation support initiatives in different cultural contexts. This article addresses this gap by (1) defining and analyzing the kinds of innovation co-production support initiatives that have emerged in the dairy sector in The Netherlands and Australia to address different challenges at different scales, (2) assessing the achievements and challenges relating to their functioning, and (3) deriving implications for dairy sector innovation policies in terms of the set-up of such innovation co-production support initiatives, their funding, and the competencies needed to make them successful in supporting co-production. We define these innovation co-production support initiatives (ICSIs) as explicit activities intended to bring together diverse actors representing different organizations and practices, and to stimulate their collaboration in order to co-produce innovation.

The section 'Conceptual framework for assessing innovation co-production support initiatives' provides the conceptual framework used to assess initiatives in the dairy sector and the documented challenges in operationalizing innovation co-production. The section 'The context in which the ICSIs operate: the Dutch and Australian dairy industries' describes the background to the dairy production context of The Netherlands and Australia in which the ICSIs operate. This is followed by the research methods in the section 'Methods'. The section 'Findings' presents the comparative analysis of ICSI achievements and challenges, and in the section 'Conclusion and policy implications' some policy implications are discussed.

Conceptual framework for assessing innovation co-production support initiatives

Main challenges for innovation co-production

Authors from several disciplines – agriculture, industry, services innovation – argue that the participation of diverse actors in innovation can enhance the effectiveness of the process in terms of innovations meeting users' requirements and enabling new technologies, practices, or products to become better embedded in society and more broadly adopted (Enkel et al., 2005; Neef and Neubert, 2011; Sumberg et al., 2003; von Hippel, 2005). The degree of involvement needs to be considered carefully, however, in terms of issues such as time availability, expected returns and competencies for participation, and the ambition level and complexity of the innovation (Enkel et al., 2005; Sumberg et al., 2003). The main

challenges to achieving multi-actor networks for co-producing innovation have been identified as:

1. *Getting the right networks of actors together on the right things:* A wide set of actors can contribute to innovation, including those traditionally associated with innovation such as research organizations and firms producing goods and services, but also actors such as traders, retailers, users of products, and civic interests groups (Enkel et al., 2005; Grin et al., 2004; von Hippel, 2005). Although bringing such a diversity of actors together can enhance innovation (greater variety increases the chance that new combinations of knowledge and resources needed for innovation will emerge), it is not easy to find and connect the appropriate actors, who do not normally interact directly (Enkel et al., 2005; Grin et al., 2004).
2. *Adequately articulating visions in response to problems and challenges and then organizing to realize such visions:* The degree to which different actors involved in innovation can adapt and change in response to a joint vision is of key importance (Grin et al., 2004). This is particularly relevant when choices need to accommodate divergent and conflicting interests of different groups, such as private (business) interests and public good interests, and should balance long-term visions with short- and medium-term actions (Klerkx and Leeuwis, 2009a).
3. *Making co-production in networks work:* Because of the different actors' diverging strategic and vested interests, inherent cultural differences between actors, different planning horizons, different incentives, and accountability mechanisms, networks do not automatically function well. Hence, innovation co-production needs to be understood as a negotiation process in which there is a continuous quest for alignment (King et al., 2010; Leeuwis, 2004).

These challenges make demands on the competencies needed to participate in innovation co-production. Effective participation requires actors to develop the ability to question their worldview and their position in the system or sector in which they are embedded, and to open up to the other actors' perspectives (Jiggins, 2001; Nettle and Lamb, 2010; Sumberg et al., 2003; Vaarst et al., 2007).

Innovation co-production needs facilitation

To enable innovation co-production, it has been argued that network brokers and facilitators are essential for mediating connections between actors and assisting them in achieving joint learning (Devaux et al., 2009; Klerkx and Leeuwis, 2008; Vaarst et al., 2007). The main functions of such network brokers and facilitators (which have been called 'innovation brokers' – Klerkx and Leeuwis, 2009b) include:

- articulating innovation needs and visions and corresponding demands in terms of technology, knowledge, funding, and policy, achieved through problem diagnosis and foresight exercises;
- scanning, scoping, filtering, and matchmaking of possible cooperation partners in innovation co-production networks;
- ensuring that innovation co-production networks are sustained and become productive, e.g. through the building of trust, establishing working procedures, fostering learning, managing conflict, and intellectual property management.

Besides having persons in the role of network brokers and facilitators, increasingly innovation co-production is facilitated by ICT applications (social media, blogs, online forums) to improve the formation of virtual communities to enhance knowledge sharing amongst actors (Klerkx and Leeuwis, 2009b).

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