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5s4a: : Waste reduction and novel resources for sustainable production of safe food or feed

Protein transition pathways and regional innovation ecosystems: characteristics, challenges and promising directions

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The rise of novel sources of proteins for human and animal consumption is a major development in Europe, the United States and Canada and is also emerging in other parts of the world. These novel sources are derived from plants, fungi, algae, insects or cellular tissues. Most alternative protein pathways contain particular technology choices, development direction, and related expectations and promissory narratives about how it may benefit sustainable development, health and the ethics of human-animal interaction. This protein transition potentially has profound impacts on land use, environmental pressures and food consumption. So far, the protein transition has progressed rapidly in both food characteristics (taste and texture) and consumption, although meat consumption remains at high levels. At the same time there are indications that most attention is being paid to protein sources and applications that enable short term financial gains and are close to current food habits and mainly substitute meat (notably plant based burgers and cultured meat), and less attention to dietary changes that presumably are more sustainable changes (notably a shift to fully plant based diets). Hence, different pathways are pursued to enact the protein transition.

In this paper, we look at the institutional and organizational makeup behind these protein transition pathways, or in other words, of their innovation ecosystems. These are networks of agents and institutions that are concerned with the development and diffusion of innovative solutions and tend to be territorially anchored. This paper studies how agents in the protein transition that are part of regional innovation ecosystems advance their protein pathways and how they interact with other pathways, each in possession of their own characteristics and histories. The paper will present the regional case study of Food Valley and how a network of small and medium sized companies, start-ups, and big corporations from the food processing industry and their collaboration partners from science and government have developed new protein sources and are since then engaged with the upscaling of their activities. We focus specifically on the

characteristics of this innovation ecosystem using of territorial knowledge governance framework (Gerritsen et al, 2018), containing the innovation mission, innovation ecosystem design, knowledge dynamics, and institutional redesign. We look at how these characteristics influenced the protein transition pathways chosen, and how these have changed over time in connection with the protein transition pathway pursued, and what this implies for future directions of the protein transition.

Keywords: Innovation, institutions, regions, food, governance