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MARKET DYNAMICS IN THE DUTCH PORK SECTOR

Currently, the Dutch pork sector is subject to social and political debate while, at the same time, farmers experience income pressures as a result of volatile commodity markets (De Greef and Casablanca, 2009). As a policy response, the government promotes the development of so-called 'integral sustainable housing systems', which aim at improving different sustainability goals, such as animal welfare, conditions on environment and working conditions (Coenraads and Cornelissen, 2011, van der Peet et al., 2013). In trying to address the economic feasibility of new housing systems, added-value markets attempt to combine extra requirements in housing systems with higher meat prices. Farmers respond heterogeneously to external pressures, such as policy instruments and market characteristics, depending on farmers' resources, individual characteristics, but also on their peers and their peers' problem definition (Geels and Schot, 2007, Geels, 2009, Dessein and Nevens, 2007). To gain insight into how the government can contribute to a more sustainable pork sector, this research presents an agent-based model for the simulation of market dynamics in the Dutch pork sector over the past 30 years under external change scenarios, with an explicit role for peer influence dynamics.

For the agent-based modelling framework we extend the Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 2005). The TPB has three components that influence intention towards behaviour and actual behaviour: Attitude, Subjective Norm, and Perceived Behavioural Control (PBC). We go beyond previous ABMs, by making more room for socially determined behaviour through the subjective norm. For this we experiment with different peer influence mechanisms, such as imitation, norm influences, and similarity influence. We do this by allowing a single agent to have multiple reference groups, e.g. farmers and citizens, which in interrelation influence farmers' reaction to external and peer group pressure. Important heterogeneity factors in farmer decision-making taken from empirical research on pork farmer behaviour are applied to the other components of the TPB. At the conference, we present the first phase of model development, focusing on model exploration and a qualitative validation of the selected attributes of agents and behavioural mechanisms. The first phase of empirical model validation follows the methods laid out by Smajgl and Barreteau (2014): Via semi-structured interviews with experts and life histories of pork farmers we determine which main factors influence market-strategy decision-making. Qualitative validation of the model is done with a focus group workshop centring on the attributes and behavioural mechanisms of the agents in the model.

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