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Topic 4 - Innovation in Organic farming: "thinking out of the Box"

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NURSE COWS FOR YOUNG CALVES: ANALYSIS OF A BOTTOM-UP INNOVATION IN ORGANIC DAIRY FARMING

Florence Hellec*¹, Mathilde Belluz¹, Nathalie Bareille²

¹ASTER-Mirecourt, INRA, Mirecourt, ²BIOEPAR, INRA, Nantes, France

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Abstract: Technical groups of dairy farmers have developed autonomous and economical farming systems using bottom-up innovation processes. Nurse cow rearing, a new way to rear young calves, was designed within such groups. The aim of our research was to analyse how organic dairy farms implement these rearing systems. We conducted qualitative interviews with farmers to explore relations between rearing practices, farmers' objectives and farm characteristics. Our results indicate that this innovation is based on a few elements: (1) it is inseparable from a global rearing system based on pasture, (2) it fits with farmers' production and economic goals and (3) it can be adapted to each farm.

Introduction: Bottom-up innovation processes are major driving forces in agro-ecological transitions, including the development of organic farming. For example, groups of conventional and organic dairy farmers designed rotational grazing to create autonomous and economical production systems (Hassanein and Kloppenburg, 1995). Currently, the new practice of rearing calves with nurse cows has emerged from these groups. The practice entails placing 2-3 calves with a cow and then separating them from the dairy herd until late weaning. This seems to be favourable to the welfare of the young animals, which can satisfy their needs to suckle and be mothered. Our research aimed at understanding factors of success of the diffusion of this new way of rearing calves. So we analysed how organic farms implement nurse-cow rearing, which is one step in this bottom-up innovation process.

Material and methods: The data analysed came from a qualitative study performed in May and June 2018 in France. We conducted qualitative interviews of 17 organic dairy farmers (4 in eastern France and 13 in western France) who had implemented nurse-cow rearing systems. We identified farmers who had adopted this practice based on information from advisers and technicians from organic agriculture organisations, as well as veterinarians. The interview guide addressed socio-technical aspects of cow-calf rearing and focused on the farmers' calf-rearing practices, their view of nurse-cow

rearing and its advantages and disadvantages. Data saturation was reached with 17 interviews, as the last few interviews provided no new information. All interviews were recorded and transcribed.

Data were analysed in three steps. First, we characterised the survey sample and developed a typology of the farms visited. Second, we analysed the content of the interviews at two levels, reconstructing the nurse-cow rearing systems themselves and their interactions with other dimensions of the farm. We then performed content analysis of the farmers' discourses (Glaser and Strauss, 1967), paying special attention to farmers' main objectives for their farms. Finally, we analysed relations between practices, discourses and farm characteristics.

Results: Description of the survey sample: Farmers in the sample were younger and more highly educated than the average French dairy farmer. Most were involved in technical groups. In their regional contexts, their farms were representative of organic dairy farms. A typology based on farm and farmer characteristics distinguished three groups: (1) "organic farming pioneers", (2) "small farmers" and (3) "recent organic farmers".

Description of nurse cow-calf rearing practices: There was no single "best way" to rear calves with nurse cows; instead, a variety of practices existed that depended on a farmer's objectives and farm structure. We identified three different management systems of nurse-cow rearing, but each had some variations (see image 1). No relation between farmer group and specific rearing practices was observed.

For all of the dairy farms surveyed, cow-calf rearing was implemented along with one or more other innovative techniques, such as rotational or dynamic rotational grazing, two- or three-way crossbreeding, once-a-day milking and first calving at two years of age. These technical changes are part of the redesign of the production system in order to optimise grazing. Belonging to a specific group was not related to adoption of a specific technique, except for the age of first calving (for all organic farming pioneers except one, for whom heifers first calved at three years of age).

More precisely, the objectives pursued by the farmers interviewed can be summarized from two perspectives: work and economic performance. All farmers emphasised that rearing calves with nurse cows had changed the nature of the work, making it less demanding and more pleasant. There was less direct intervention on calves as these young animals were fed by their nurses, and as they had less health problems. But the group of calves and nurse cows needed daily surveillance in order to detect any problems, and to prevent calves from being too wild. Moreover, two difficult steps were mentioned by farmers: adoption of calves by nurse cows and separating cows and calves. For economic performance, farmers in groups 2 and 3 intensified their farms to increase production while remaining autonomous. In contrast, organic farming pioneers (group 1) maintained an extensive production system, which they considered more in accordance with natural processes.

Discussion:

In scientific literature, there is presently great interest for rearing systems that maintain maternal bond between cow and calf after birth in dairy farms. Most of the researches focus only on cow-calf rearing management and on effects on calves' and cows' well-being (for example: Wagenaar, Langhout, 2007; Johnson and al., 2016). But they don't take into account impacts on farmers' work and economic performance of the farm.

Conversely, we analysed farmers' experience to understand how new calf rearing practices were designed on farms. So we showed that the success of calf rearing with nurse cows relies on following elements: (1) it is inseparable from a global

rearing system based on pasture, (2) it must fit with the production and economic goals of the farmers and (3) it is a “loosely coupled” system (Coughenor, 2003), so that farmers can adapt it according to the characteristics of their farms and management practices.

So calf-nurse cow rearing system appears as a compromise between satisfying animals’ natural needs and the search for productivity inherent to all agricultural activities. As our results shows it, this rearing practice is adopted by organic dairy farmers whose professional values can be different. However, at present, this technique is specific to autonomous and economical dairy farming systems that are based on grazing. It does not seem to be suitable for other dairy farming systems.

One limit of our work concerns the constitution of the survey sample. We chose the farmers interviewed with the help of different stakeholders who worked in agricultural organisations. Maybe we missed farmers who had no relationships with these organisations and who may implement other rearing practices than those we identified. Anyway, for the farmers interviewed, changes in rearing practices come mainly from discussion with other famers, especially in technical groups. Here bottom-up innovation relies on local collective dynamics and also include trainings and professional trips to farms that implement new rearing techniques.

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