Management of gastro-intestinal parasite pressure, under grazing in organic farms: development of a Decision Support System through the mobilisation of a participative research process

D. Jamar[1], V. Decruyenaere[1], Y. Seutin[1], D. Stilmant[1], L. Perriaux[1] and P. Stassart[2]
[1]*Farming Systems Section, CRA-W, 100 rue du Serpont, B-6800 Libramont, Belgium, daniel.jamar@skynet.be,*
[2]*Society, Economy, Environment and Development, ULg, av Longwy, B-6700 Arlon, Belgium*

Keywords: participative research, organic meat production, consumption food chain

Introduction Under grazing, gastro-intestinal parasite management remains a major problem in ruminant production systems, more especially in systems respecting organic farming rules following their obligations (1) to perform grazing as soon as pedo-climatic conditions are adapted and (2) to use anti-parasitic products only in a curative way. Surprisingly, this problem has not been highlighted by the different stakeholders in the food chain from cattle meat production to consumption. This could arise from the lack of a clear and pertinent norm or infestation threshold that would allow differentiation between preventive and curative treatments. Such a norm would indicate to the breeder whether he was permitted to treat his herd or not. The question is how to involve the stakeholders in a participative research process in order to develop a decision support system (DSS) adapted to their needs, when there is, initially, no clear demand for such a system. We present the steps followed to develop such a DSS: (1) stakeholder sensitisation to the question, (2) data recording with farmers and developing the DSS principle, (3) data processing and DSS calibration and validation.

Stakeholder sensitisation A multidisciplinary team comprising an agronomist, a sociologist and an economist was formed to help analyse, develop and increase awareness of the organic cattle meat food chain 'producer – retailer – consumer'. Their work highlighted the need to increase the sustainability of this chain through the development of a new meat product. Organic cattle meat must be different from the conventional 'lean and tender' young Belgian Blue bull meat, which represents the majority of the Belgian cattle meat market. One way to induce product differentiation, from its colour, flavour and nutritional quality aspects, lies in increasing the importance of grazing in the feeding scheme of these bulls. So the obligation to include grazing in organic farming, could become a resource to achieve product differentiation and to improve the sustainability of the market. This was the starting point for a collaborative project dealing with the food chain and including a research consortium and several organic producers. The objectives of this project are to differentiate a new food chain product (organic beef meat) and through true cooperation with the research consortium to develop a new shared approach to management, where each producer has his own conception of what is a good grassland, a good stock, a good breeder etc. This evolution of approach significantly modified the researcher question from the identification of a pertinent threshold to perform only curative anti-parasitic treatment to the co-definition of the grazing management scheme to promote in order to optimise stock performance.

Data recorded and DSS development principle To reach such a target, parameters characterising grassland quality, animal intake and parasitic pressure have been recorded on 14 farms, together with the recording of animal health status and performance (average daily gain, ADG). Grassland quality was assessed by measurement of sward surface height, sward quality and floristic composition, whilst behaviour assessment involved calculation of expected intake and observed intake, through NIRS analysis of, respectively, grass and faeces. Coproscopy and plasmatic pepsinogene were used to assess parasitic pressure. All parameters were recorded and discussed in association with farmers, in order to be in complete interaction with them and to be able to consider their points of view. The key steps in the DSS are (1) estimation of potential intake from sward quality, animal type and weight, (2) model potential ADG, (3) compare predicted ADG with observed ADG, (4) seek reasons for the difference between observed and predicted levels of intake and performance, considering the level of parasitic pressure and/or the general health status and/or the sward availability.

First results and conclusions The results from the 2003 grazing season, which was characterised by dryness and low parasitic infestation, demonstrated the good performance of the relation used to predict ADG ($r=0.724$; $N=13$; $p<0.01$). Data from 2004 will allow improvement in the calibration of the DSS (i.e. the link between parasitic pressure and animal performance below the potential) and give further experience on its usefulness in co-defining, with the farmer, the causes of levels of animal performance observed under grazing. This DSS will be used more as a 'diagnostic' tool than a 'predictive' one. It will provide a comprehensive quantitative framework for exchanges between the farmer and his advisory service.

Acknowledgement This research is funded by the Second Program of Sustainable Development Support of the Belgian Science Policy.