

# An integrated Italian research project on organic animal husbandry

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**Abstract** – In 2005, huge project of integrated research on organic animal husbandry was initiated in Italy. This research combines, for the first time in Italy, various disciplines in order to affront existing problems in the animal organic sector. The research will be conducted on 19 farms, located across Southern, Central and Northern Italy, in order to fully represent the climatic environments of the Italian peninsula. The topics investigated range from a complete substitution of soy in animal feed to avoid GMOs, to the reduction of micotoxin contamination risks, to pasture improvement and to the use of animal breeds more adapted to organic production. The project duration will be 3 years, and is expected to provide Italian organic farm breeders the long-awaited answers to various questions.<sup>1</sup>

## INTRODUCTION

Organic animal husbandry has gained impetus in Italy after the approval of EU Regulation CE 1804/99 (Table 1). However, a more profound understanding and optimization of the systems of rearing and feeding must still be attained.

**Table 1.** Organic animals reared in Italy (MIPAF, 2006)

Species	1999	2005
Cattle	17,000	215,022
Sheep and goats	25,000	556,793
Swine	7.4	26,508
Poultry	680,000	2,152,295

The requirement for research is essentially based on the difficulty in applying the law, in that national agricultural politics are currently oriented towards the strong expansion of organic agriculture and husbandry. In addition, the breeder often finds himself having to affront technical and managerial difficulties, derived from the conversion to the organic method without solid scientific support and reference points. From this framework, the requirement to finance national research projects in order to resolve these critical points was identified.

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## THE "EQUIZOOBIO" PROJECT

The project, financed by the Marche, together with funds from 17 other Italian regions, is entitled: Efficiency, Quality and Innovation in Organic Animal Husbandry (E.QU.I.ZOO.BIO). The project is coordinated by the economist Raffaele Zanolì, from Faculty of Engineering of the Polytechnic University of Marche, and includes 22 partners who represent the most important Italian universities and centres of research on organic field as well as organic organizations. The project involves the collaboration of 19 animal-based farms (located in the South, Centre and North of Italy). The farms participate directly in the definition and achievement of the research, and form the focal point in the publicity and transfer of the results.

## MAIN OBJECTIVES

Following an investigation, carried out in collaboration with the main Italian organic organizations and associations, the major problems common to all animal husbandry activities were identified (Zanolì et al., 2004, Saltalamacchia et al. 2003, Martini et al., 2005). These problems include: 1) The risk of GMO contamination in animal feed, primarily as a consequence of soy product usage; 2) The risk of micotoxin contamination in feedstuffs, caused particularly during the harvest and conservation of these, and 3) The risk of micotoxin contamination in products destined for human consumption (milk and meat). In fact, the possible presence of GMOs and micotoxins in food products are of concern to the Italian consumer, which in turn may result in damage to the image of the organic product.

Therefore, the main targets of the project are: 1) Identification of the critical points in the application of organic farming practices in the most common types of animal husbandry farms in Southern, Central and Northern Italy; 2) Utilization of alternative protein substitutes to replace soy usage in animal rations, in order to completely avoid the risk of GMOs; 3) Improving the quality of the pastures; 4) To study the effect of these diets on meat and milk production both quantitatively and qualitatively, as well as to study these dietary effects on the sensory characteristics of the products; 5) To reduce the risk of aflatoxin contamination in organic animal farms; 6) Identification of the critical points regarding animal welfare in Italian farms and to evaluate possible compatible solutions and 7) A technical and economical evaluation of solutions and innovations introduced into farm management, particularly with re-

gard to diet, using technical and economic parameters.

#### WORK PACKAGES

The project has been structured to contain 11 work packages, of which the first 5 are directly involved and focussed on animal aspects (WP 1 to 5), whilst the remainder (WP 6 to 11) impact in a cross-sectional manner.

WP1 Beef cattle: improvement of the breeding system, improvement of pastures, substitution of soy in the feed in order to avoid the risk of GMOs, evaluation of meat quality, and production of organic meat using dairy calves.

WP2 Dairy cattle and buffalo: improvement of the breeding system, substitution of soy in the feed administered to milking cows, control of aflatoxin contamination, quality evaluation both milk and cheeses and the improvement of the pastures.

WP3 Dairy sheep: elimination of both the GMO risk and the presence of aflatoxins in the feed, qualitative evaluation of feed, of pastures and of the meat, milk and cheeses produced by this system and parasite control by both agronomic pasture management practices and herbal remedies.

WP4 Poultry: a study towards the possibility of using rations without soy, the selection of more useful genotypes for organic meat production (comparison of slow growing and medium-fast growing genotypes) and the evaluation of meat quality with particular attention aimed at a rapid control system to distinguish organic production from that of conventional production.

WP5 Swine breeding: verify the technical results obtained from conventional animal farms which converted to organic management, to monitor variations in the technical results after agronomic and animal interventions to replace soy products with alternative protein sources which are easily cultivated in Italy, survey of the productive performances and qualitative evaluation of the animal products obtained with various nutrition diets.

WP6 General coordination of the project. The objectives of coordination are essentially two-fold: 1) administrative and scientific coordination, and 2) quality control of the project.

WP7 Working relationships with farms, the publicity and transfer of results: 1) participation from the various learning phases of the WP 1 to 5 and the facilitation of contacts with the farms, 2) publicity and transfer of results.

WP8 Economics of organic animal production: calculation of the level of economic sustainability of farms that adopt both organic agricultural practices and the innovative applications as proposed by the WP 1 to 5. A comparative economic analysis of the organic animal rearing systems will be carried out using, as representative study cases, 6 farms in the North, 7 in the Centre and 7 in the South.

WP9 Agronomy: evaluation of sustainability at farm level by an analysis of data, collected from the representative farms defined by WP 1 to 5 (Migliorini, 2006). This methodology uses sustainability indicators (regarding biodiversity, soil quality, farm efficiency, environmental risks) in order to highlight both limiting factors on the farms as well as the

potential of the farms. Experimental activity is carried out in two organic farms: one in Tuscany and one in Marche where experimental plots has been designed for the production of protein sources as an alternative to soy in two regions (protein-rich peas, faba beans, and lupins).

WP10 Animal welfare: to have accessible an evaluation form on animal welfare for each animal species using both direct and indirect tests focusing on critical focal points for organic breeding conditions. Verification and evaluation of these forms.

WP11 Quality: It will be carried out in a multidisciplinary activity (animal scientists, technologists, marketing experts) in order to realize a common protocol to evaluate the quality within each product examined. In particular, the following analyses will be arranged: classical laboratory analyses (physical-chemical), a rapid NIR spectrophotometric analysis, a panel-based descriptive sensory analysis, and a sensory analysis of the food quality as determined by the consumers.

#### CONCLUSIONS

The project will be able to provide useful information concerning the potential elimination of the GMO risk in feedstuff. Additionally the project will also be able to provide direction concerning the reduction of the micotoxin risk in both animal rations and products. The project will be also able to provide clear information regarding the economic sustainability of these choices, especially considering that some food industry have clearly shown an interest in producing foods with the biological label "organic product without soy: GMO risk = 0". The agronomic-based research will provide information on the possibility to carry out alternative protein-producing crop cultivations within the various regions. Important considerations will also be derived from the analysis of the animal welfare on the farms, thereby producing animal welfare evaluation forms for each species. Product quality will be evaluated based on various points of view, ranging from the classic to the most innovative. Finally, from the results obtained, the widest possible publicity of the results between all the interested subjects will be secured.

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