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THE MSc. STUDY PROFILE OF ANIMAL SCIENCES,THE DUTCH EXPERIENCE

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Introduction

Animal production systems are highly diversified systems in which the animals play a key role, not only in single production systems but also as integrated part of whole farming systems. Constrains to livestock development are not only zootechnical or veterinary in nature (feed supply, animal health, genetic potential, management quality, product quality) but also infrastructural, socio-economic and political factors are highly relevant.

Livestock specialists need in-depth scientific training combined with a critical attitude towards all aspects constraining livestock development. Additionally, practical skills related to extension service, managerial and communicative abilities are needed for optimal in-field activity. This contribution deals with the rationale, design and profile of the academic education in animal science and animal production.

Rationale

The basis for the MSc program at the Wageningen Agricultural University (WAU) Is In the mission statement of WAU: "wishes to develop and disseminate the knowledge needed to sustainably supply society's demands for sufficient, healthy food and a good environment for humans, animals and plants".

Clean soil, water and air, good quality food, healthy plants, animals and people are all essential conditions for life on this planet. Core of the research at WAU regards the complex relationships between man and his natural environment, all along the respective links in the chain from (a) quality of soil and water, to (b) crop and livestock, to (c) processing of agricultural products into food and other useful products, to (d) human nutrition and safety.

Graduates must be capable of formulating the problems facing agriculture, nature and the environment, and of helping to create a new balance between agriculture and environment, and between human intervention and natural recovery, all in an international setting.

Design and profile of the MSc program

Originating from its historical development and tradition, WAU had spread its academic wings over the world since the twenties. The areas most involved in the beginning were agriculture, forestry and horticulture. Later on these areas have been expanded. The creation of 13 MSc programmes, offered in English, was no more than a formalization of long existing scientific exchange programmes. The 13 MSc programmes are:

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Soil and Water
Management or Agricultural Knowledge Systems
Crop Science
Tropical Forestry
Biotechnology
Ecological Agriculture
Geographic Information Systems for Rural Application
Agricultural Engineering
Animal sciences
Aquaculture
Agricultural Loonomics and Marketing
Environmental Sciences
Urban environmental Management

The course in Animal Sciences, created in 1960, is centered around 0 subspecialzations (major MSc thesis areas): animal husbandry, animal breeding, animal nutrition, animal production systems including tropical animal husbandry, grassland and forage science, veterinary epidemiology & economics.

Major **objectives** of this MSc course are to impart advanced knowledge, modern approaches in scientific research, analytical skills and critical attitudes, so that the successful graduates can develop Animal Science in their own country.

The **target population** consists of:

- young graduates seeking careers as scientists in government, university or other research and development institutes, and organizations;

- experienced professionals employed in government, university or other research and development institutes and organizations who wish to undertake further academic training.

The MSc course is spread over 17 months of which the first 9 months comprise lectures, practical exercises, assignments and short excursions. During the second part of the course considerable time is spent on individual field, animal experimental or laboratory research leading to a thesis in the area of chosen subspecialization. An individual program comprises educational elements up to 61 credit points in total.

These 61 credit points are divided into 4 main packages:

- the major thesis in the area of subspecialization (27 credit points) on a subject chosen after discussion between supervisors and candidate;

- the subject matter or advanced course elements, related to the topic of the major thesis. Most of the elements are compulsory, others are optional. Around 16 credit points are listed.

- the research methodology elements. These are more general and fundamental in nature, and hence not specifically related to the topic of the thesis research. Around 13 credit points are listed.

- Individual free optional. Any registered course at WAU may be selected by the candidate. The number of credit points usually exceeds 5.

A full listing of elements within all subspecializations Is given in appendix I.

Results of the MSc course

On a course basis about 10-15 candidates are registered for the MSc course in animal science each time. They are selected from a ten times higher number of applicants, financial support and educational background being the most limiting factors for admittance. An exam of admittance is taken in each applicant's respective country. The TOEFL test for assessing the English language mastering is taken whenever estimated to be needed.

Admittance criteria refer to BSc level or equivalent in agricultural, animal, veterinary or biological sciences. Admittance exams

mainly deal with physiology, basic mathematics and statistics. About 20% of those who pass the admittance exams will ultimately enroll in the program. Granting comes from international fellowship-granting organizations and Dutch bilateral development projects.

Selected candidates originate from Africa and Asia mainly (40 and 41%); a minority comes from South America and Europe (T and 12%). They usually come from governmental institutions, research institutions, industry or universities; others are fully private persons. between 1985 and 1992 about 75 candidates have enrolled in the program. Program costs can be estimated at 10.000 USC (1995 currency rate).

The average output rate per course is 87%, the average percentage of drop outs being 13%. Of the 87% about 81% passed all requirements within the study period set, whereas 5% passed these requirements with some delay varying from 1 to 12 months. Most of the graduates return to their home country, only a few do not and for example proceed with a PhD or accept a job outside their home country. In 1991 the MSc course program has been evaluated by a team of external experts (International Consultations Socrates). They concluded that "the curriculum of each course is of high quality with a good balance between theory and practice" and that "the comparative advantage of the courses is high".

Discussion and conclusion

The MSc course in animal science has been successful for several years. Part of this success is due to the highly flexible educational system which makes the individual study profile for each candidate tailor-made. The optional elements to be choosen by each candidate provide an optimal basis for this success. The course program fits well within the regulations for MSc programmes put forward by the European Union.

The thesis research does not only refer to an academic exercise. Its main aim is to train people, involved in research, management. education or extension, in problem solving abilities.

Activities are proceeding to integrate the MSc course into the regular Dutch students' program. In some MSc courses this has been successfully implemented, in others not yet or not ye to full extent.

The MSc courses can be considered as a linkage between education and the field, but also between education and research at the PhD level. For more practice-oriented objectives a series of Professional Masters courses is under development. Also in the regular educational setting for Dutch students where an additional fifth academic year has been approved for animal science, there is a tendency towards the extension or the profile with more professionally oriented elements such as marketing, communication, management science.

These processes and courses are focussed on the labor market, where there is an increasing demand for both scientifically trained people and academics with a more vocational and profession-oriented background. Universities have to provide the means for the "supply side" in this balance between demands and supplies. This phenomenon does not withdraw the continuous task of universities to provide postgraduate training and summer schools on specific topics of interest to those in the field.