
NORFA: The Norwegian-Egyptian project for improving local breeds of laying hens in Egypt

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The present case study deals with a large-scaled poultry research and training project performed at the Faculty of Agriculture, Menofya University, Egypt, in close cooperation with the Department of Animal Science, Agricultural University of Norway.

The idea of starting a research and training project with the aim of improving the local breeds of laying hens in Egypt was suggested during the second author post graduate stay at the Department of Animal Science, Agricultural University of Norway (AUN), in 1977-1978. The project planning, such as scientific layout, the breeds that should be included, the facilities needed and the design of the buildings required, etc. were discussed and finally decided upon during the year 1978 before it was introduced and later approved by The Norwegian Agency for International Development (NORAD), who agreed to offer financial support for the first five years of the project period.

In the early spring of 1980 all the facilities, equipment, machines, etc., required for the experiments to be started were sent from Norway to Egypt. Before this the Faculty of Agriculture, Menofya University, Egypt, (MUE) had decided to offer all the financing needed for buildings and other facilities, which were ready for use at the time the shipments arrived in Egypt.

Egyptian indigenous chickens have the advantage of being well adapted to the local stressful conditions in the province; high temperature, serious disease problems, poor farming hygiene and unbalanced diets. Another “advantage” of the indigenous chickens claimed by the local consumers

Introduction

Aim of the project

The most important traits directly considered in the selection programme were egg number, egg weight and body weight. A selection index technique was applied based on parameters obtained in the base population. Since 1994 various selection indexes such as “Two-stage Selection Index”, “Restricted and Reduced Selection index” and “Index including feed efficiency”, were applied, mainly because they produced data for scientific studies and training.

Approximately 3 000 birds were included in the project per year, and the original plan designed to achieve the goal was actually followed throughout the experiment and up to the present stage. In several meetings and conferences throughout the years the results obtained were discussed and some corrections made. A Panel Meeting about the NORFA Project and a Round Table Meeting were arranged in 1992 and 1997, respectively.

The two local breeds included in the project, *Fayoumi* and *W. Baladi*, are the two most frequently used local breeds for egg and poultry meat production in the province. The high performance lines, *L2* and *L7*, were closed egg production lines imported from Norway, *L2* selected for high egg number and *L7* selected for high egg weight. The “new breed” developed from this synthetic population was named *Norfa*.

Native Egyptian hatcheries, constructed of sun-dried bricks, still play a significant role in supplying the farmers with day-old chicks. These hatcheries produce more than 65 percent of the day-old chicks in the villages.

Experiments carried out to compare the fertility and hatchability of eggs from the experimental strains and controls and further to compare results obtained in artificial incubators and in native Egyptian hatcheries, were expected to establish differences between genetic groups and to give an idea about how much is to be gained by using modern hatching machines to produce day-old chicks.

The results showed minor differences in fertility and hatchability between the genetic groups, but the difference between artificial and native hatcheries showed that there is a lot to gain by using artificial incubators, or as recommended by Abdou (1997), supply the owners of native hatcheries with cocks from improved lines to increase fertility and hatchability.

One important aspect of the NORFA-project was to evaluate the genetic potentialities of the NORFA-chickens at practical farm level. Therefore, several tests were performed on small farms in the neighbourhood of the Research Centre at the Faculty of Agriculture, on other university farms and at locations outside the province of Menofyia. In general the tests

Conclusions

Improvements in fertility and hatchability

Testing NORFA-chickens on farms

showed promising results. The NORFA layers produced considerably more eggs than the local birds did, and the fertility and hatchability of the eggs were good. The conclusion was that even though the NORFA layers are still below the commercial hybrids as far as egg production is concerned, the NORFA layers proved to be very suitable to the villages where poor management in general prevails, due to their high adaptability to the local environment. On average the NORFA-layers exceeded the local birds in egg production by approximately 25 percent .

Research and training

The NORFA project was very well utilised for training and research purposes (see later) and all the equipment, machines and battery cages are still in good condition and their function is good. Moreover, computer units with modern computer programmes provided from Norway and later on from the Faculty of Agriculture, were successfully utilised in all the research activities carried out under the project. This transfer of technology and general knowledge may be regarded as one of the most important parts of the project.

Transfer of improved genetic quality to practise

Even though there was not a full-fledged scheme worked out in the original design for disseminating the hopefully improved stock into practise, there was a strong intention to include this issue into the overall plan. After a period of scientific research the project was meant to serve the small farms in the province with improved chickens for egg and poultry meat production. Regrettably, it has to date, not been fulfilled, mainly because of lack of resources. To overcome this problem there was an urgent need to establish an office for poultry extension in the Department of Animal and Poultry at the Faculty of Agriculture. An extension officer who is specialised in this field will undoubtedly be able to relay on helpful information and support to the small holders.

Financial and technical support

The final year of the five-year period of financial support from The Norwegian Agency of International Development (NORAD) was 1985. From this time the Faculty of Agriculture, MUA, has financed the project completely with its own funds. The authorities of the University and the Faculty of Agriculture have always very sincerely encouraged the project and kindly offered all the finance needed for the buildings and other facilities. Several of the staff members competent in different sectors of poultry science, have been very helpful and have done an excellent job since the initial stage of the project.

The on-going project has played an important role as an arena for studies for a large number of undergraduates as well as for postgraduate students. The number of students at all levels doing their practical part of the different poultry production courses during the academic year 1998/99 was close to 500.

Scientific papers and training

The following set up gives a survey of the number of PhD. and MSc. degrees obtained using data from the project as a basis for their dissertations. It also shows the number of scientific articles produced since 1980, most of them published in scientific journals, others are to be found in congress proceedings or in seminar reports:

PhD granted 5
PhD in progress 6
MSc. granted 12
MSc. in progress 3
Scientific articles published 52
Scientific articles in progress 3

As mentioned in the introduction of the present case study, the idea arose during Prof. Abdous, the second author, two years post-graduate stay at the Department of Animal Science, ANU. Through very close scientific cooperation within the field of poultry genetics and production systems we very soon went into the problem of genotype-environment interaction and adaptability to various environmental conditions. From this point the idea very soon became reality.

Reasons for introducing the activity and what we learned

This kind of cooperation between scientists and universities very often creates ideas. However, there is often a long way to go from idea to reality. In our case we were happy to get the support we needed to accomplish our ideas.

Nowadays the trend in developing countries is to import commercial hybrids and improved breeds of chicken. Some of the modern technology needed to satisfy high performance of these chickens is also imported including some feed ingredients, vaccines, etc. In most cases these imported breeds of chickens are lacking necessary adaptation to the local environment. Moreover, they are not resistant to the serious endemic diseases to which native chickens are genetically resistant. Therefore, if we were to start again we should take the following points into consideration:

- Adaptive quality
- Natural resistance to some serious diseases
- Selection under stressful effects

Three methods to improve native chickens are:

- a. Importation of improved breeds to produce only F_1 for each generation.
- b. After crossing exotic with native breeds a selection programme should be started to develop a new breed. The selection programme must include all important and relevant traits regarding the specific local conditions.
- c. Systematic and long-term selection within native breeds.

A lesson from the present poultry breeding trends seems to be that there is an urgent need for establishing gene banks for indigenous chickens in developing countries. This is because indigenous chickens no doubt possess some advantages in their genetic potential that will be of great importance in the future. Lack of adaptive qualities of the different exotic breeds introduced to tropical and subtropical countries followed by reduced egg production performance, seems to be a matter of fact. According to Katule (1998) it seems to be more advisable to transfer the technology of chicken breed improvement than to transplant breeds to developing countries.

We have also learned from the present research and training project based on close cooperation between Egypt and Norway, that an experimental centre (centre of competence) like the one established at the Faculty of Agriculture, Menofya University, is of great importance for the successful development of knowledge within the field of animal husbandry, both scientific and applied, in a less developed country.