

法規名稱：MEMORANDUM OF UNDERSTANDING ON COOPERATION BETWEEN THE COUNCIL OF AGRICULTURE, REPUBLIC OF CHINA, INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE, FRENCH REPUBLIC

簽訂日期：民國 80 年 05 月 23 日

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Understanding has been reached between representatives of the Council of Agriculture (COA) of the Republic of China and the Institut National de la Recherche Agronomique (INRA) of the French Republic, whose delegations are listed in Annex 1, concerning cooperative activities according to the following considerations:

- 1 Since 1983 scientific cooperation in animal research has been under way between Taiwan Livestock Research Institute (TLRI) and INRA.
- 2 A status review of the cooperative program has been made and both parts agreed that the program between TLRI and INRA should be continued and carried out for five years according to the subjects defined in Annex 2.
- 3 Other subjects of particular interest have to be discussed and are presented in Annex 3. Both parts agreed to give reciprocal answers within a reasonable time.
- 4 Both parts agreed to exchange scientific information about their research work, exchange animals in order to set up joint experiments in both countries, exchange research workers in order to identify cooperative items of mutual interest, to follow up the planned experiments, and to complete joint publications.
- 5 Research work in laboratories for the cooperative program will be supported with the funds of each Institute following their usual practice. Some common experiments in both countries are planned. Supplementary funds will be needed for the exchange of researchers: short visits to do research, and pre-doctorate and post-doctorate scholarships. For the short research visits (1-4 weeks) each Institute will pay all expense for its own researchers, but some special invitations can be made when jus-

tified. Each institute may offer scholarships for post-doctorate study.

6 Both parts agreed to extend the cooperation to other agricultural fields, particularly biotechnology, and will do the best to facilitate cooperation with other institutions of the other country.

IN WITNESS WHEREOF, the representatives of the two parts have affixed their signatures hereto.

Done in Taipei on the 23rd day of May of the year One Thousand Nine Hundred and Ninety-One.

For the Council of Agriculture

[Signed]

Torng-chuang Wu

Secretary General

For the Institut National de la

Recherche Agronomique

[Signed]

Pierre Douzou

President

ANNEX 1.

COMPOSITION OF DELEGATION

REPUBLIC OF CHINA

Torng-chuang Secretary general of

Wu Council of Agriculture

Paul M. H. Sun Commissioner, Taiwan

Provincial Department

of Agriculture and

Forestry

Te-yeh Ku Director, Food and

Agriculture Department

of Council of Agriculture

Shuang-ching Director, Animal

Chyr Industry Department of

Council of Agriculture

Frederic P.N. Chief, International



Chang                      Cooperative Division of  
                                 Council of Agriculture

Chein Tai                Director General of  
                                 Taiwan Livestock  
                                 Research Institue

#### FRENCH REPUBLIC

Pierre Douzou        President of the Institut  
                                 National de la Recherche  
                                 Agronomique

Jean Razungles        Director of International  
                                 Relations, Institut  
                                 National de la Recherche  
                                 Agronomique

Jean-Michel            Delegeue of International  
                                 Affairs, Ministry of  
                                 Research & Technology

Pierre Mallet          Deputy Director of  
                                 French Institute of  
                                 Taiwan

R. Rouvier             Senior Researcher of the  
                                 Institut National de la  
                                 Recherche Agronomique

#### ANNEX 2. ITEMS OF COOPERATION OF INITIAL INTEREST

- (1) duck breeding and genetics
- (2) application of mixed model methodology in breeding and genetics
- (3) rabbit genetic improvement and rex gene studies
- (4) evaluation of the performance of naked neck chicken in Taiwan
- (5) sheep and goats genetics and physiology
- (6) monoclonal antibodies, chromosomal studies, gene mapping, genetic polymorphism in casein and cell genetics

subjects 1,2,3 and 4 will be carried out in five years, and 5 and 6 are to be discussed. Detailed research plans for the subject above are contained in the attached Appendix.

### ANNEX 3. ITEMS OF COOPERATION TO BE STUDIED

#### WASTE WATER TREATMENT

Animal waste treatment technique including removal nitrogen and phosphorus from the effluent, high temperature anaerobic fermentation, growth of spiral blue-green algae (*Spirulina platensis*) and training of personnel.

#### APPENDIX

##### 1 DUCK BREEDING AND GENETICS

Researches about the intergeneric cross between *Cairina moschata* and *Anas platyrhynchos*:

###### (1) Estimation of genetic parameters in crosses

Crossbreeding experiment between brown Tsaiya and Pekin in order to estimate the genetic parameters of crossbreeding (additive genetic effects, both direct and maternal, and heterosis effects) for mule duck production (duck reproductive traits and mule duck growth traits). The same experiment will be done in both locations (INRA in France, TLRI in Taiwan). It is expected to find the best use of the Brown Tsaiya genes to improve mule duck production, according to the environment (Temperate or Tropical climate).

###### (2) Genetics of the trait duration of fertility by artificial insemination with Muscovy semen

Data which had been already collected from TLRI will be analyzed and according to the results a new experiment will be set up. It is expected to find if it is possible to inseminate once a week instead of twice a week to increase the efficiency of duck production due to reduction in labor time.

###### (3) Muscovy selection for growth rate and meat quality

.1 Muscovy for mule: From line 302 available in ILan Duck Research Center, an experimental selection scheme will be set up in order to increase growth rate in the young with a restriction for adult body weight. The purpose is to increase mule duck growth rate and to improve its anatomical composition for meat production.



.2 Pure Muscovy: As there is a new market for pure muscovy, Taiwan plan to import Muscovy from France in order to define how to utilize this new genotype in the new environment (Tropical climate).

(4) Genetic, nutritional effects and physiological mechanism for egg shell quality in ducks

(5) Artificial insemination with frozen semen

TLRI studied cryopreservation of duck semen and got 60% egg fertility rate with frozen semen.

The sharing of this new technology with TLRI should be appreciated by INRA.

(6) Geese raising and genetics for meat

As there is a geese breeding station (Changhwa) in TLRI with Chinese and White Roman geese, a Common interest is existing about meat production from geese. Specially the fact that Chinese geese in Taiwan is laying from September to July (but with a low intensity rate) seems to be interesting in order to increase the duration of laying.

## 2 APPLICATION OF MIXED MODEL METHODOLOGY IN BREEDING AND GENETICS

Statistical techniques e.g., BLUP and animal model, were well developed to increase the accuracy of genetic evaluation of breeding stocks, especially for the less hereditary characteristics. According to the bilateral interests of TLRI and INRA in this aspect, it would be useful to consolidate the team in both Institutes to develop cooperative researches in both quantitative genetics and statistical methodology for animal genetic improvement as well as in computer program for simulation and for analysis of data from animal breeding experiments and farm testing. Therefore, it is proposed to have visiting scholars exchange annually from both Institutes in additive and non-additive genetic models for both continuous and discrete traits.

## 3 RABBIT GENETIC IMPROVEMENT AND REX GENE STUDIES

TLRI is interested by rabbit genetic improvement for meat and



fur production and INRA is particularly interested in the study of Chinchilla Rex rabbits and the artificial insemination (AI) technique used in rabbits. Also the preliminary results obtained from the study of Rex gene done in INRA indicated that the hypothesis of an unfavorable pleiotropic effect of Rex gene to the whole productivity was rejected. Therefore, selection will be effective and building a high productivity strain for this purpose to develop and conduct the same kind of experiments as follows in both locations:

- (1) selection for fur quality and productivity in Rex strain
- (2) application of AI in meat and fur types rabbits

This is interesting for both parts and feasible

#### 4 THE EVALUATION OF THE PERFORMANCE OF NAKED NECK CHICKEN IN TAIWAN

Dr. Merat has pointed out the apparent association of naked gene (Na) with heat tolerance in his review (1986). The naked neck chickens with the genotypes of Na/Na or Na/Na<sup>+</sup> showed a better performance in body weight, egg production, egg weight and egg mass than the na/na<sup>+</sup> chickens under the temperature above 30°C. The average temperature of Taiwan are above 27°C from April to November. Whether the advantages observed for the naked neck chickens at constant high temperature also occur in fluctuating temperature environments and at various of Taiwan. Therefore, it will be worth trying to raised naked neck chickens in Taiwan.

#### 5 SHEEP AND GOATS GENETICS AND PHYSIOLOGY

Researchers from INRA are interested in study of goat  $\alpha$  - casein alleles associated With economically important traits. TLRI is interested by sheep genetic improvement for production and reproduction (e.g., high prolificacy booroola gene), and goat artificial insemination techniques as well as embryo transfer through endoscopic method. Therefore, it is proposed

- (1) an exchange of frozen embryos from Ramanov sheep of INRA with those from Taiwan native goat of TLRI, and
- (2) researcher(s) from TLRI will visit INRA for application of

endoscopic method in embryo transfer.

Feasibility of (1) has to be discussed with the researchers involved

#### 6 MONOCLONAL ANTIBODIES, CHROMOSOMAL STUDIES AND CELL GENETICS

Exchange of researchers for exchange of information and studying some special topics are needed and suggested in order to identify feasible programs of common interest.