



Projects Description
for
ARASIA TC Programme



TC Cycle 2012-2013

Project Number: RAS5063

Project Title: Improving the Reproductive and Productive Performance of Local Small Ruminants by Implementing Reliable Artificial Insemination Programmes

Field of Activity: Livestock production

Objective: To improve small ruminants productivity by implementing reliable artificial insemination programmes

Problem statement: Increasing sheep and goats populations by means of both improving the reproductive performance of ewes (lambing rate) and does (kidding rate) per year and increasing the number of lambs and kids born per day per year (fecundity rate) is considered an important demand for the development of the small ruminants production, since sheep and goats are the most important farm animals in the ARASIA Member States. A large number of the population in the ARASIA Member States rely on livestock especially sheep and goats for living. In order to improve the livelihood of the sector of population, there is an urgent and increasing need to improve the animal production, reproduction and Health which will eventually contribute to the enhancement of food security through the implementation of sustainable livestock production systems. The majority of local animals in the ARASIA region have a poor reproductive and productive performance (low fertility, fecundity and milk production, poor growth rate, poor twinning rate. A lot of efforts will need to be made in order to ensure sustainable Animal Health and Production in the ARASIA Member States which can be partially made through the use of nuclear and nuclear related techniques, among of which is radioimmunoassay which could be strongly applied in animal production and reproduction studies such as characterization of some reproductive parameters including the onset of puberty, breeding season and early detection of pregnancy), estrous synchronization and induction programmes, semen evaluation, laparoscopic examinations for assessing the ovarian follicles, corpora lutea, collection of oocytes and embryo transfer, and Artificial Insemination (AI). Artificial insemination is probably the most important single technique devised to facilitate the genetic improvement of animals. The widespread use of AI in large ruminants has allowed accurate genetic evaluation and rapid dissemination of genetic merit on a national and international basis to the benefit of both breeder and consumer. It has also enabled the use of sophisticated data analysis procedures to identify animals of superior performance. The availability of an efficient sheep AI service would yield similar benefits and would greatly enhance the scope for commercial breeders to respond positively and effectively to consumer demands. However, for many years AI of sheep was thought to be impractical, mainly due to the difficulty of detecting oestrus and controlling the oestrus cycle. The inability to freeze ram semen was another factor that limited a wider use of AI. However, today with the use of exogenous hormones, the synchronization of the oestrus cycle is possible. In addition, ram semen can now readily be frozen which opens the door for interstate as well as international movement of semen. The widespread use of AI and the realisation of the full potential of AI services depend essentially on the adequacy of selection of rams and bucks, the quality of semen, heat detection, and the technique used. Semen can be used as fresh, cooled, and frozen. Better results can be obtained with frozen semen; however, acceptable results can also be obtained using fresh and refrigerated semen if proper methodologies are taken into account. Unlike cattle and goats, sheep are not easy to inseminate. Their internal anatomy is so twisted and delicate that inseminating through the cervix is usually complicated and therefore requires proper training. Insemination can be done intravaginal, cervical, transcervical and intrauterine, depending on the facilities and type of animals. Heritability estimates of most reproductive economic traits of sheep are generally low (below 0.20) which means that the rate of genetic

progress anticipated from selection for these traits will be slow. AI is one of the effective programmes followed to improve reproductive performances in sheep because it can spread well and strong genotype by following AI programmes.

Past and present regional efforts to address the need: There have been many programmes and projects performed by regional partners (e.g. the Arab Center for the Studies of Arid Zone and Dry Lands (ACSAD) and International Center for Agricultural Research in the Dry Areas (ICARDA). The regional approach was the most cost-effective due to the availability of sheep genetic resources and experts and exchange of information and experience among team members. Technical information related to reproductive performance and health status of sheep flocks in various ARASIA States has been obtained through various IAEA TC projects, and more recently, 7 Asian countries participated in the Coordinated Research project (CRP) "Characterization of Small Ruminant Genetic Resources in Asia" where DNA, phenotypic and geographic data and farming system information have been collected from approximately 4000 sheep and goats from 89 breeds/populations.

Past and present support to the region by the IAEA in the same Field of Activity: There was coordination between the IAEA and some involved countries through CRP entitled "Characterization of Small Ruminant Genetic Resources in Asia"

End users: End-Users: Ministries of Agriculture, Colleges of Agriculture and Veterinary Sciences, research centres and other involved institutions in ARASIA States party. Beneficiaries: Livestock farmers and population involved in livestock activities.

Strategy: The project strategy involves the organization of regional technical meetings on utilized new programmes to improve performance traits and issues related to the development of small ruminants production to overcome fellowships, scientific visits and exchanges to develop greater familiarity with best practices and shared experiences.