

ACIAR's Strategy for the Advancement of Animal Production in Australia and in the Developing World

Denis Hoffmann* and Peter Young*

Abstract

ACIAR was established as a statutory body in 1982 by the Australian Government to encourage and support collaborative research in the agricultural problems of developing countries. The Centre subjects each request for collaborative research support to careful scrutiny prior to development and implementation. Projects should be high priority and generate mutual benefits for both partners. There should be a significant economic impact with good potential for spillover of benefits to other countries. Finally the projects should have an acceptable environmental and gender impact aimed at development of sustainable agricultural systems.

The four main thrusts of the Animal Science Program are small ruminant production and health; large ruminant production and health; developing appropriate technologies including biotechnology and developing sustainable integrated production systems.

Any strategy for the future needs and priorities for animal production research must be flexible to accommodate the rapid change that is occurring in the national and in particular, the international research environment. ACIAR considers animal (livestock) production in its widest sense to include fish, poultry, domestic ruminants and exotic species and realized, because of its small size, that the development of collaboration amongst international research groups is needed to achieve a complementary effort.

Introduction

ACIAR (The Australian Centre for International Agricultural Research) was established as a statutory body in 1982 by the Australian Government to encourage and support collaborative research into the agricultural problems of developing countries.

ACIAR's roles are to initiate and develop collaborative research projects; to provide funds for such research; to monitor progress of the research projects which it funds; and to communicate results and evaluate the impact of each project. The Centre does not undertake its own research.

ACIAR's corporate mission is to improve the well-being of people in developing countries and Australia through collaborative research partnerships aimed at the development of sustainable agricultural systems and the design of appropriate natural resource management strategies.

ACIAR has an investment budget of \$A14 million/year of which about 22% is presently used for animal production and health activities.

Animal production increases can play a big part in improving the well-being of the rural poor. For example, animals represent a bank which can be cashed as required and sales of commodities such as milk represent a daily cash income. Because there are strong linkages

*Centre for International Agricultural Research, GPO Box 1571, Canberra, ACT, 2601, Australia.

between the livestock sector and other sectors of the economy, growth in the livestock sector may stimulate overall economic activity.

A major determinant of the level of livestock production is the supply of available feed. In developing countries, livestock feed supplies are based on the grazing or harvesting of communal grasslands whose production is static. One method of increasing feed supplies is to utilize crop by-products of small mixed farms. Increases in crop area, cropping intensity and crop yield thus result in increased feed availability to livestock. In integrated crop-livestock systems, part of the crop output is utilized as livestock feed while livestock inputs such as draught power, manure and cash income provide an augmentation of crop output.

From ACIAR's point of view, cereal-based grain feeding for livestock such as intensively reared pigs and poultry has very limited application to the rural poor of Asia, hence the concentration of effort given to the ruminant.

Technologies in agriculture can be classified into two broad categories; those that reduce the cost of production and those that increase productivity. Examples of the former include increases in efficiency brought about by changes in management practices and control of disease (eg. by vaccination or by strategic use of chemicals or by quarantine). Examples of improved productivity include upgrading of breeds by selective breeding or improving the capacity of the animal to utilize low quality roughage eg. by supplementation.

Research projects in these areas have traditionally used low-technology solutions. One of the challenges for the future is the application of biotechnology to either solve some of the currently difficult problems or provide novel means of achieving objectives. One of the interesting aspects of biotechnology is that, although the research involves high-technology, the application of the research may not. For example, recombinant vaccines for viral or bacterial diseases may be administered by conventional means, genetic modifications to rumen microflora allowing improved utilization of low quality roughage may be simply administered by drench. Biotechnology approaches extend the range of options available to redress agricultural problems. However, unrealistic claims for the likely benefits of biotechnology are as dangerous as is the rejection of biotechnology by conservative research planners.

ACIAR's general strategies and priorities

ACIAR subjects each request it receives for collaborative research support to careful scrutiny prior to development and implementation. The following considerations are examined:

- 1 Is the project a high priority in the partner country?
- 2 Is the project a priority for Australia and likely to generate mutual benefits?
- 3 Is it an area of research where Australia has demonstrated expertise and do Australian research institutes regard it as a priority concern?
- 4 Will the project have a significant economic impact if it is successful?
- 5 Does the project offer the prospects of significant spillover effects to other regions and countries?
- 6 Is the project consistent with Australia's strategic humanitarian and trade interests?
- 7 Is the project appropriate for public versus private sector funding and do the intellectual property implications prevent widespread spillover of benefit to poorer groups?
- 8 Does the project have acceptable environmental and gender impacts?

ACIAR ensures that its project activities encourage management of natural resources in an ecologically sustainable manner to ensure effective social and economic development. Efforts to channel resources towards women's development are in recognition of the vital role they play in livestock development.

ACIAR's strategies in animal (livestock) production

Any plan to accommodate the future needs and priorities of animal production research must be sufficiently flexible to take into account the rapid changes that occur in national and international research environments. ACIAR considers animal (livestock) production in its widest sense to include fish, poultry, domestic ruminants and exotic species. Also the term disease includes both infectious and non-infectious diseases and where necessary, genetic predisposition or resistance to certain pathogenic or metabolic disorders. Disease is a critical constraint on livestock production throughout the world. The identification of diseases which affect any given production system, followed by reduction of the incidence of these diseases and, if possible, their eventual eradication, must be given high priority if adequate economic returns related to the investment costs in the system, are to be achieved (Doyle and Spradbrow, 1989).

ACIAR's Animal Sciences Program funds research projects in animal production and health and divides its areas of interest into four:

- 1 Small ruminant production and health.
- 2 Large ruminant production and health.
- 3 Developing appropriate technologies including biotechnology.
- 4 Sustainable integrated production systems.

1 Small ruminant production and health

Many countries in Asia are increasingly interested in the better utilization of sheep and goats, which are often more advantageous to keep than large ruminants. They can be kept by the landless rural poor or grazed under plantation crops to control weed growth, thus reducing the need for excessive herbicide use.

ACIAR has funded a number of research projects on small ruminants, including helminths and nutrition of sheep in China; sheep breeding in China; mineral nutrition of sheep in China; helminths of sheep and goats in the South Pacific; bluetongue disease of sheep and goats in Malaysia.

2 Large ruminant production and health

The focus of the large ruminant program has been milk and draught animal research and is particularly directed at buffalo. Most of the world's 130-150 million buffaloes occur in Asia. In India the average buffalo produces four times as much milk as the average cow and very successful dairy cooperatives have been established. Examples of ACIAR research programs include the control of parasites in buffalo; control of tick-borne diseases; the genetic identification of strains and genotypes of buffaloes; evaluation of different buffalo genotypes for draught, meat and milk production; self medication of ruminants in tethered husbandry systems; multi-disciplinary studies of draught animal power systems; increasing the efficiency of utilization of straw; immunity to bovine ephemeral fever; epidemiology of foot-and-mouth disease.

3 Developing appropriate technologies

Many technologies developed to solve production problems in Australia can, with adaptive research, be used to advantage to solve similar problems in developing countries. There is an increased interest in research projects in this area, especially as the biotechnology research capacity of developing countries continues to grow.

Examples of ACIAR-funded projects in this area include the establishment of improved methods for the diagnosis and control of livestock diseases using ELISA; development of foot-and-mouth disease diagnostic methods; development of a feed delivered Newcastle disease vaccine; development of an improved vaccine against hemorrhagic septicemia.

4 Sustainable integrated production systems

Projects in this area integrate with the Centre's other programs namely Economics, Soils, Forestry, Crops and Forages. The only current example is a joint project with Forestry on the breeding and management of bees in Indonesia.

Conclusions

There are about one billion people (that is 20% of the world population) regarded as living in absolute poverty. ACIAR has an investment budget of approximately \$A14 million per year of which about 22% (\$A3 million) is presently used for animal science activities. Trying to influence the lives of a target population of one billion people with resources of \$A3 million/year calls for low cost interventions that have big effects.

ACIAR realizes that because of its small size, the development of collaboration amongst national and international research groups is needed to achieve a complementary effort.

References

- 1) Anon. (1990) : Agricultural biotechnology : the next "green revolution"? World Bank technical paper No. 133. pp. 16.
- 2) Brumby, P. (1989) : Livestock and food production strategic issues for IFAD. IFAD Report No. 0163, pp. 1-36.
- 3) Cunningham, E. P. : Animal production. *In* : Agricultural biotechnology : opportunities for international development. Edited by : Persley, G. J. C. A. B. International University Press, Cambridge. pp. 169-175.
- 4) Doyle, J. J. and Spradbrow, P. B. (1990) : Animal health. *In* : Agricultural biotechnology : opportunities for international development. Edited by : Persley, G. J. C. A. B. International University Press, Cambridge. pp. 176-186.
- 5) Fleming, E. (1991) : Improving the feed value of straw fed to cattle and buffalo. ACIAR Economic assessment series No. 3. pp. 1-31.
- 6) Guise, K. S. (1988) : Application of recombinant DNA techniques in animal improvement. *In* : Biotechnology applicable to animal production and health in Asia. Proceedings of the regional workshop on biotechnology in animal production and health in Asia. Kasetsart University and FAO. Bangkok, Thailand. pp. 32-52.
- 7) McWilliam, J. R. (1989) : Opportunities and implications of biotechnology for livestock in Asia. ACIAR Working Paper No. 26, pp. 1-9.