

STRATEGIES TO IMPROVE BALI CATTLE IN EASTERN INDONESIA

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Economic Issues at a National and Regional Level

Ir. Don P. Utoyo¹

Abstract

In Indonesia the Directorate of Livestock Breeding is responsible for the establishment of the strategic actions and directions of livestock breeding development, including semen, embryos, hatchery eggs and live animals. Current conditions, problems encountered and policies for national livestock breeding are outlined.

There is no doubt that efforts are required to enhance the effectiveness and efficiency of breeding stock for each species, and for different breeds within species. The mainstream activities of the national livestock breeding policy are conservation, maintaining crossbreeds and creating new breeds.

One of Indonesia's native cattle species is the Bali breed. These animals represent the country's second largest cattle population. Their advantages are that they are fertile and well muscled and have good adaptability to harsh conditions. They have also been utilised for crossing, usually to Simmental or Limousin sires, but this crossing is still prohibited on the island of Bali. There are indications that Bali cattle have been subjected to negative selection, while their susceptibility to *Jembrana* disease is still an obstacle to their more widespread use.

Measures for local autonomy are now being introduced in Indonesia, but one thing to keep in mind is that a better and clearer understanding among stakeholders will support a breakthrough in animal breeding approaches so that eventually the goals will be reached.

Introduction

THE Directorate General of Livestock Services, through the Directorate of Livestock Breeding, is responsible for the establishment of national livestock breeding policies associated with standardisation, the formulation of technical procedures, norms, the development of systems for varieties and livestock breeding, and certification of the quality, distribution, monitoring and evaluation of breeding stock in farm animals including semen, embryos, oocytes and hatching eggs.

Many species of livestock, and many breeds for each species, are found in Indonesia.

There are three categories of livestock breeders in Indonesia:

- village breeding centres (VBQs), which account for about 90% of livestock farmers — mostly dairy, beef, buffalo, goat, sheep and ducks;
- private breeder enterprises, which are involved particularly in layers, broilers and pigs. The

private sector is expected to invest capital in all types of livestock except native chickens. Native chicken breeding is allowed for farmers who run small but economical-scale units in rural areas.

- government breeding stations such as Livestock Embryo Centre, Cipelang; Lembang AI Centre; and Singosari AI Centre. The breeding centres are located at Indrapuri Aceh, Siborong-borong Sumatera Utara, Padangmangatas Sumatera Barat, Sembawa Sumatera Selatan, Baturaden Jawa Tengah and Pleihari Kalimantan Selatan.

Problems Encountered in Breeding Activities

Since Indonesia is a developing country, several internal and external factors may influence the sustainability of breeding farms, including:

- The quantity and quality of breeding stocks is not sufficient.
- Uniformity of livestock breeding stock has not yet been achieved.
- The business risks of breeding farms include low return rates, since it takes a long time before returns start coming in.

¹ Director of Livestock Breeding Development, Directorate General of Livestock Breeding, Jakarta, Indonesia

- Upgrading of breeding stock is in progress in most species except for layers and broilers.
- Breeding programs in the country are still not yet ready to compete against free trade areas.

Characteristics of Bali cattle

Bali cattle, which have several local names such as Balinese, *Bibos banteng*, *Bibos (Bos) banteng* and *Bos sondaicus*, are native Indonesian cattle used mainly for meat and draught power. They are an important part of the society and culture of many regions.

The growth rate of the Bali cattle population has been steady. In 1970 Bali cattle numbers were around 3 million, but by 1999 there was a total population of more than 4 million head, widely distributed in almost all provinces in Indonesia. Village breeding for Bali cattle is found particularly in South Sulawesi, East Nusa Tenggara, West Nusa Tenggara and Lampung but also in many other regions.

Nevertheless, in certain areas the quality of Bali cattle has declined. This has occurred due to such factors as inbreeding and negative selection. The disposal of very good stock could not be controlled and many were sent to slaughter. It is now difficult to find Bali cattle breeding stocks with a wither height of 102 cm for cows and 105 cm for bulls.

Morphology

The origin of Bali cattle is domesticated Banteng, a wild cattle species in Indonesia called *Bibos banteng* Wagner or *Bos sondaicus* Schegel and Muller. Adult liveweight for Bali males is 475 kg and for females 250 kg, while adult wither heights are 120 cm and 110 cm for males and females respectively.

Males are reddish-brown in colour, turning black with increasing age with white patches on the hind-quarters, while females are yellow reddish-brown with white patches on the hindquarters and legs. Both males and females are horned, and the horns form a sharp U-shape.

Bali cattle cope well even on poor pastures or fodders, and show high heat tolerance. They also have a high degree of disease resistance, but are susceptible to malignant catharal fever (MCF), carried by sheep and Jembrana disease. Other advantages are that they are very prolific, possibly due to their long heat period, and that their meat is very tender and lean.

Performance

Management conditions are referred to as extensive (low input/non-backyard) and backyard/farmyard production. Commonly, Bali cattle are kept in backyards for a few months of the year; otherwise they

are kept on pasture. Adults held at farmhouses are fed farm by-products and fodder as well as being allowed to graze.

Data on the average performances of Bali cattle are:

- birth weight — male 17 kg, female 14 kg;
- average age at sexual maturity — male 16 months, female 16 months;
- age at first parturition — between 22 and 26 months;
- parturition — 380 days;
- length of production life — 8 years;
- milk yield per lactation — 600–900 kg;
- lactation length — 90–150 days;
- milk yield — per year 500–1000 kg, per day 4 litres;
- lean meat yield — 38–44%;
- daily weight gain — 200–600 g;
- carcass weight — 200 kg;
- dressing percentage — 56%.

There are still some questions as to what is the genetic composition of pure Bali cattle, and we do not yet know whether we can find purebred animals or not. Bali cattle in Sulawesi are more resistant to Jembrana disease than similar cattle in Bali, while in Bali (desa Taro) we also find white Bali cattle.

Conservation and use

Bali cattle conservation in situ will be implemented in Nusa Panida island. Cryo-preservation of semen is done at the Signosari AI Centre, though no cryo-conservation of embryos has been done so far. It is noted that in Bali, a major objective has been to maintain and conserve the species. Besides maintaining the pure breed of Bali cattle, efforts will be undertaken to enhance the rate of improvement of Bali cattle breeding stock, in quantity as well as in quality.

National Livestock Breeding Policies

Change is under way in Indonesia since the declaration in January 2001 of National Policies UU No. 22 1999 and PP No. 25 in 2000. Conservation from now on will not be driven or implemented by the central government, but by the provincial governments. A consensus between national and provincial governments on how to use animal genetic resources is now being developed. Whether breeding policies for a species are formulated partly at national level or partly at provincial level will depend on the importance of the animals involved in terms of their economic value, and how much they can contribute to better incomes and other social conditions. Breeding policy will be at provincial level if the animals' genetic resources are

of little value and their contribution to national welfare is small. Relevant factors include their suitability for local environments and their importance in the local society and culture.

The national economic value of contributions from some locally exploited species is limited. Examples include Alabio ducks in Alabio Kalsel, spotted buffalo in Tanah Toraja Sulsei, and Kedu chickens in Kedu Central Java.

The development of systemic breeding stock

This aspect of national breeding policies comprises:

- sub-systems of breeding improvement, such as selection and crossing of replacement stock and genetic engineering;
- sub-system production and multiplication, with close relationships to VBCs, private breeders and a government breeding station;
- sub-system distribution, with close relationships to the market situation. To maintain equilibrium of supply and demand, the government when necessary will use a quota system;
- sub-system of quality control. In order to make sure that the quality of breeding stocks is guaranteed, mechanisms of standardisation, certification, and product labelling are to be used, supported by mechanisms of inspection. Government inspectors will be recruited and their skills will be developed through training courses.

The master plan of national breeding policy

The direction of breeding policy consists of dual approaches of conservation and the use of animal genetic resources simultaneously, as symbolised by two sides of a coin. Conservation itself refers to how we maintain genetic resources as they are, while the use of animal genetics is related to how we make efforts for breeding improvement based on crossing (breeding methods) and environmental considerations.

Conservation

Conservation can use either in situ or ex situ methods. In situ programs have been carried out for Madura cattle in Sapudi island, Bali cattle in Bali and Dompu West Nusan Tenggara, and Pelung

chicken in Cianjur. Ex situ approaches have been used for Bali cattle at the Singosari AI centre.

Crossbreeding

The use of Dutch Friesian as the flagship for dairy cattle is questionable, since these animals in the Java environment and climate are restricted to the upland areas above 700 metres. Their numbers are steadily decreasing due to the development of infrastructure and the tourist industry. Therefore, for lowland areas, dual-purpose cattle will be raised and developed such as the Friesian × Ongole cross and the Grati and Simmental × Ongole cross. The new dairy centre will be relocated outside Java. The same approach may be used for Bali cattle as well. The crossing of Bali cattle is needed to support self-sufficiency in beef.

Creating an Indonesian breed

This program is still going on, including Bali cattle crosses to Simmental in West Nusa Tenggara, and Brahman bull–Bali cow crosses.

Strategic development of the breeding industry in Indonesia

The strategic steps for improvement of the breeding industry are linked to the issues of national livestock development in Indonesia during the past 5 years, particularly since the economic and monetary crises. The main issues are:

- how to attain self-sufficiency in beef production by the year 2005;
- how to maintain self-sufficiency in egg production and to promote poultry meat (white meat) as a potential substitute for beef (red meat) in the near future;
- how to increase the domestic milk supply to meet national demand.

Challenges for the investor as a breeder

Capital investment is needed for all breeding stock except native chickens, and this includes Bali cattle. National markets and international markets are very promising.