Development of record keeping systems for genetic improvement of village milk buffaloes in Bangladesh: a case study

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Summary

Accurate record keeping is essential for effectiveness of selective breeding for genetic improvement of buffaloes. To ensure that the record keeping is accurate, a total of seven systems was introduced in different locations from 1888 to 1999. System VII proved to be the most effective for accurate record keeping of buffaloes.

Introduction

Bangladesh possesses a substantial number of buffaloes (820 000). Milk yield of indigenous buffaloes is higher than that of indigenous cattle, but lower compared to exotic improved buffalo breeds. Therefore, measures should be taken to improve the productivity of indigenous buffaloes through appropriate husbandry practices as well as genetic improvement of the animals. FAO has recommended the Open Nucleus Breeding Scheme (ONBS) with or without MOET, for animal genetic improvement through selective breeding in developing countries.

The ONBS may make it possible to select bulls accurately since bulls will be selected from the nucleus unit. However, problems associated with field recording of the productive traits of village herds have to be solved. The following are the problems to face when implementing an effective record keeping system for productivity traits of village herds of buffalo in Bangladesh, as in many other developing countries:
1. Lack of infra-structure and trained personnel
2. Illiteracy of the farmer
3. Existence of middle-men
4. Poverty and socio-economic problems.

To solve these problems, a number of attempts were made in different locations where dairy buffaloes are raised in the country (Table 1). The aim was to find out an easy and economical method for accurate record keeping systems for practicing selective breeding in the villages.

Table 1. Description of the experiment: farmer's degree of literacy, animal management system and record keeping system in the experiment sites.

Site	Degree of literacy	Animal management system	Prevailing record keeping system
Trisal	All farmers are illiterate	Buffaloes were raised by individual farmers under a semi-intensive system	No record keeping existing
Bogra	All farmers are illiterate	Buffaloes were raised by individual farmers under a semi-intensive system for 6 months, then collectively in *bathan* under an extensive system for 6 months	Milk yield is not recorded but the amount sold is recorded by milkman
Noakhali	All farmers are literate	Buffaloes were raised collectively by cowboys in *bathan* under an extensive system throughout the year	Milk yield is recorded through a graduated bamboo stick following traditional counting method, by both the cowboys and the milkmen

A number of systems were practiced in Tirsal during 1988-1992. The best one was identified and was applied to the other sites during 1998-1999 to test whether the system was equally effective throughout Bangladesh. The details of the systems are presented in table 2.

Table 2. Different tentative recording systems experimented in different sites.

Period	Location	Distance From campus	System no.	Description of the system
1988-90	Trisal	20 km	I	Farmers were provided with record sheets and asked for record keeping. A qualified graduate was engaged to supervise the programme.
			II	Same as system I + some medicines and concentrate feed were given free of charge.
			III	Farmers were provided with record sheets. Some medicines + concentrate feed were given free of charge. Nobody was engaged to supervise the programme. Farmers were asked for record keeping themselves.
			IV	Same as III + a record keeper was engaged (instead of a qualified graduate).
1991-1992	Trisal	20 km	V	A cooperative was formed with all farmers. All medicines + concentrate feed were supplied free of cost. Milk was sold to middle-men. A literate son of the farmer was employed as supervisor. Farmers were provided with record sheets and asked for record keeping.
			VI	A cooperative was formed with all farmers. All medicines + concentrate feed were supplied free of charge. Milk was sold to the Dairy Technology Laboratory of BAU at a fixed price for preparation of yoghurt and butter. The profit was used to purchase feedstuff, medicines and pay the salary of the supervisor who was the son of one farmer. Records were kept by the supervisor.
1998-1999	Trisal Bogra Noakhali	20 km 200 km 450 km	VII	A cooperative was formed. All farmers and their literate sons were trained on record keeping. Medicines and concentrate feed were supplied with record sheets. One trained son of a farmer of the cooperative was employed as record keeper and supervisor.

Results and discussion

The outcome of the seven tested systems is presented in table 3.

Table 3. Outcome of the seven tested systems for record keeping.

System no.	Merit	Demerit
I	No input cost involved.	1. No cooperation from farmers. 2. No record keeping. Selective breeding is not possible.
II	Farmers tried to cooperate.	1. Necessary cost for input supply. 2. Incomplete and inaccurate record keeping.
III	Farmers tried to cooperate.	1. Necessary cost for input supply. Record keeping was impossible due to lack of farmers' knowledge.
IV	Farmers tried to cooperate.	1. Necessary cost for input supply. 2. Record keeping was sometimes hampered due to negligence of the record keeper.
V	Farmers were interested. Record keeping was more accurate than in the four previous systems.	1. Necessary cost for input supply.
VI	Farmers and cooperatives were interested. No cost on-field is involved. Full recording was feasible. Selective breeding could be practiced.	A processing plant and selling centre were requested and were very expensive. It can be practiced on a cottage industry basis. It cannot be practiced on large scale operations.
VII	Farmers and cooperatives were interested. Full recording and partial recording were both feasible. Selective breeding could be practiced on small as well as large scale operations.	Demerits associated with the above six systems could be overcome except for the cost of salary of supervisors and training costs.

For small-scale operations for example, when the herd size is small and located in a small geographical boundary, system VI will be unique as already proved by the author (1994. Bangladesh Journal of Animal Science, 96-101). However, this system might be proved to be ineffective and unrealistic when we have to consider a greater geographical boundary as in case VII. System VII will be very effective, as already proved by the author (1998. First annual report. Bangladesh Agricultural University, Mymensing, p. 27). Through this system, selective breeding could be practiced whatever may be the management or whatever may be the distance of unit from the centre of evaluation as both partial recording (for example Bogra) and full recording (Trisal and Noakhali) are possible.

It can therefore be concluded that system VI will be effective for small geographical boundary and system VII will be effective for greater geographical boundary for accurate record keeping on productive traits of milk buffaloes in villages, for subsequent selective breeding.