TECHNICAL BULLETIN

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Development of Strategies for Fertility Improvement in Repeat Breeder Dairy Cattle

A repeat breeder (RB) is a cow that has returned to oestrus after a third or more service, is exhibiting normal intervals between oestrus, has calved at least once, is <10 years of age, has no evidence of abnormalities of the genital organs and has no abnormal genital discharges. RB is a serious problem leading to large economic losses for dairy producers due to prolonged calving intervals and increased culling rates. Some studies in Bangladesh have reported RB cow prevalence in different regions of the country. There are different opinions among scientists about the cause of RB such as early embryonic loss, hormonal imbalance, management and environmental issues, etc.

The RB syndrome impacts the dairy industry as it causes increased culling, reduced milk production, and reduced value of the breeding stock. However, most reports of RB in cows lack detailed characterization of the reproductive performance of the repeat breeder and risk factors. In view of this, research was carried out to determine the epidemiological and patho-biological factors associated with RB under commercial farm and rural conditions in Bangladesh. Efforts were also be made to establish a proper synchronization protocol for timed artificial insemination (TAI) and to implement embryo transfer (ET) in the improvement of fertility of repeat breeders.

Methodology

Major steps in the study involved on-farm surveys (epidemiology), microbiological and hemato-biochemical analyses of samples from RB cows and treatment of RB cows.

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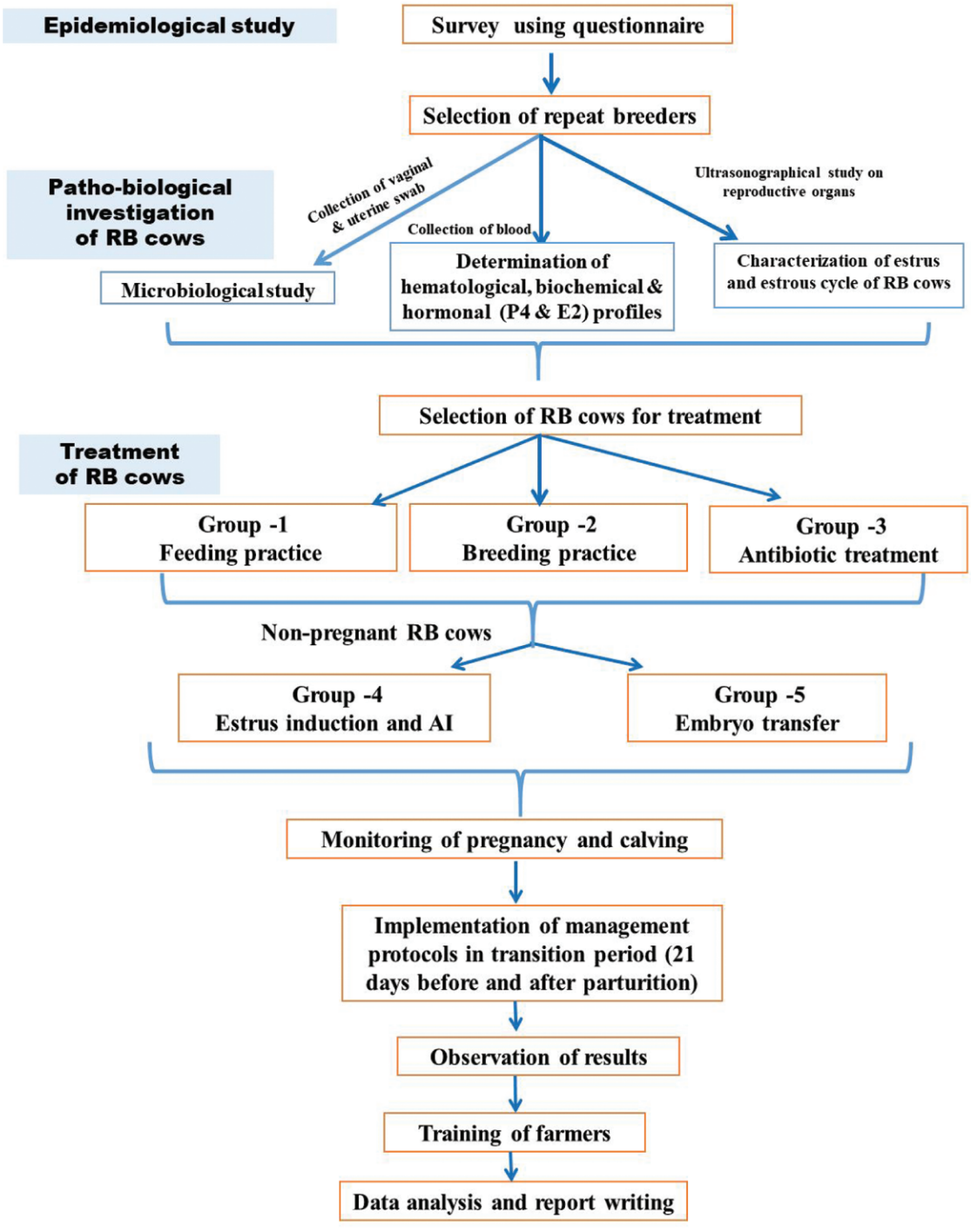

Flow chart of the project activities

Results and Outputs

- Overall prevalence of RB cows (RBC) was found to be 20.48% (412/2012). Occurrences of RBC were the highest in the Frisian (F x L) crosses, intensive farming system, poor drainage and poor hygienic conditions, 97-120 months of age, early sexual maturity, short estrus duration, lower graffian follicular diameter and lower number of follicles at estrus, presence of graffian follicles at left ovary at estrus, bred with AI and parturition in winter
- Among the hemato-biochemical parameters, total cholesterol, triglycerides, high density lipoprotein, total protein, glucose, calcium and phosphorus in RB cows were lower than those in normal cows
- The total viable count (TVC) of bacteria and uterine pH were significantly higher in the uterine fluid of RB cows than those in normal cows
- Occurrences of endometritis, acute mastitis and sub-clinical mastitis as previous diseases were higher in RB cows than in normal cows
- The mean value of estrogen was higher in RB cows than in normal cows in the entire cycle but at day 0 it was lower in RBCs, whereas the mean value of progesterone and VER were lower in the RBCs than normal cows
- Well-timed and double AI was effective in the improvement of fertility of RB cows
- TAI after estrus induction was highly effective in the improvement of fertility of RB cows
- Embryo transfer was effective in the improvement of fertility of RB cows
- A total of 332 RB cows out of 400 (83.00%) got pregnant after the experimental treatments
- A total of 325 calves were delivered from the pregnant cows

Male calf born after embryo transfer in RB cow

- Among the 325 post-partum normal cyclic cows, 303 (93.23%) were pregnant normally through balanced feeding and double time AI (8-10 hours apart) after 40 days post partum estrus.

Reproduction clock for cows

Benefits and Outcomes

- Better understanding of the reproductive physiology of RB, which in turn, can help improve the breeding strategy and develop better management practices for them; information on the role of hormones (E_2, P_4 and PRL) and TAI following oestrus induction on pregnancy and calving rates in cows.

- Awareness of farmers about the causes of reproductive failure of dairy cows and ways and means to overcome these problems
- Findings can help set proper breeding plans for regular production of especially faster generation high genetic merit through multiple ovulation and embryo transfer (MOET) specially vitrified embryo transfer in recipient

Expected Impacts

Findings of the project will help develop proper strategies for the prevention of the RB syndrome in dairy cattle. Dairy farmers will be financially benefited by the improvement of fertility in their cattle. Since 80-90% of cattle in Bangladesh are raised by almost exclusively smallholder farmers, any program to improve cattle production will greatly impact their incomes and benefit the rural society.

Recommendations

- Benefits of the research need to be expanded to other areas of the country
- Detailed studies on the relationship between mastitis and RB syndrome in dairy cows need to be undertaken
- A pilot project should be initiated for the prevention of RB in dairy cows; veterinarians and farmers should be intensively trained on reproductive health management in dairy herds.

This technical bulletin has been prepared on the basis of technical information available from a completed CGP project of KGF, the details of which are given below:

Project Code and Title: TF 24-EM/15. Epidemiological and syndrome and development of strategies for improving the fertility of repeat breeder dairy cattle
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