

ECONOMIC ANALYSES OF THREE DIFFERENT METHODS OF PREGNANCY DIAGNOSIS IN DAIRY CATTLE OF KERALA

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INTRODUCTION

Dairy farming in Kerala is moving on through a very critical phase, with a swiftly declining cattle population (DAH, 2012). The two major problems, dairy farmers face today are the high cost of production and the low cost for their produces (Swaminathan, 2008). These make dairy sector economically unviable and totally an unsustainable livelihood, mainly for the rural people. Many major lapses for this had been identified and policy interventions made to resolve these, are on its way. One of the major issues, often ignored, is the method of pregnancy diagnosis of cattle in the state.

Early pregnancy diagnosis (PD) in cattle is very important in reducing the inter-calving period. Subsequently, this can maximize reproductive efficiency and improve the productive potential of dairy cattle, which is of prime importance in economic cattle rearing (Dionysius, 1991; Gowan, *et.al*, 1982).

Pregnancy diagnosis in cattle by uterine palpation per rectum (UPR) is the only method followed in field conditions of Kerala. The UPR usually takes 60 days post artificial insemination

(AI) to give an indication of conception, even for skilled persons. Other two methods which can be adopted in field conditions of Kerala are Milk Progesterone Assay (MPA) and Transrectal Ultrasonography (TU).

This study aims at economic analyses and comparison of these three methods of pregnancy diagnosis in cattle, then weighing many related factors, to determine the best method, under prevailing conditions in Kerala

MATERIALS AND METHODS

Three methods for diagnosis of pregnancy in cattle-uterine palpation method, milk progesterone assay and transrectal ultrasonography are analysed economically and compared to find the best option to improve the reproductive efficiency in dairy cattle. Only these methods were studied, after considering their handy nature, use and adaptability in field conditions of Kerala.

The average number of days required post artificial insemination for diagnosing pregnancy for these three methods were estimated from previous studies. The optimum day for diagnosing pregnancy in cows by UPR is estimated to be 60 days post AI, after considering the fetal viability (France *et.al*, 1987; Romano *et.al.*, 2007),

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accuracy (Gowan *et.al.*, 1982) and the availability of skilled persons in field conditions. The number of days post AI required for pregnancy diagnosis using MPA and TU were estimated to be 23 days (Gowan *et.al.*, 1982) and 26 days respectively. The accuracy of MPA is around 95 percent. Diagnosis with TU on 26 days post AI, showed a sensitivity and specificity of 89.2 percent and 93 percent, respectively (Romano *et.al.*, 2006).

The average daily milk yield of cow in the state is 8.5 liters (DAH, 2012) and the average market price of milk in the state is estimated to be INR 20/- per liter based on the present market conditions and for the ease of calculations. The average age at first calving in optimum farming conditions in Kerala is 1094 days (Naicy and Anilkumar, 2009). The average reproductive life in a dairy cow is eight years (Roberts, 2004).

From these estimates, the total reproductive life of a dairy cow is calculated as 2920 days. Deducting the age at first calving from the total reproductive life, the productive days comes to 1826. This comprises of 5 lactations with 4 dry periods of 60 days each. So the total productive life in a dairy cow's life is estimated to be 1546 days. The total milk production of the cow for these 1546 days is estimated as 13141 liters. So, each day lost from this productive life of the cow definitely decreases the returns expected. The total loss is calculated multiplying the number of days, average milk production and the cost of one liter of milk. The estimates are based on the assumption that the cow is inseminated at the immediate heat, if diagnosed non pregnant. Using these estimates, all the three methods were compared and the losses in productive days were calculated for each using pay-off table method.

STATISTICAL ANALYSIS

A pay off table was used in the analysis to find the best of the methods, under given conditions. The different methods were then weighed, against the cost incurred and the ease of on-field application, to determine the best method.

RESULTS

Pay off analysis revealed Transrectal Ultrasonography to be best method. After weighing this result with many factors like the cow-side use, expertise, cost involved and the user friendly nature in conditions of Kerala, this study suggest the use of Milk Progesterone Assay for pregnancy diagnosis in cattle in Kerala.

DISCUSSION

A pay off table method was selected for this study instead of cost-benefit analysis, because authors intended to consider the benefits of the methods during the initial part, which may otherwise, deter the intention of this study. This analysis had got many limitations and every part of the analysis was carried the after considering the prevailing conditions in Kerala. The cost involved, expertise required for Transrectal Ultrasonography and Milk Progesterone Assay is not discussed here, because it comes from the part of the Government, which is not directly involved with the benefits it has on dairy farmers.

Milk progesterone assays facilitates the testing of milk sample on the day of collection and produce results within hours (Wimpy *et.al.*, 1986). The authors strongly recommend the use of Milk Progesterone Assay, for the diagnosis of pregnancy

Table.1 A pay off analysis revealing the loss incurred due to the reduction in the productive life span of a dairy cow, due to the different methods of PD post AI

First insemination				
Method of pregnancy diagnosis	Day of AI	Days required for PD	Productive days lost if not pregnant and not returning to oestrus	Loss to farmers in INR
UPR	0	60	39	6630
MPA	0	23	2	340
TU	0	26	5	850

Second insemination (assumed that AI is performed at the immediate oestrous, if diagnosed non pregnant)

Method of pregnancy diagnosis	Day of AI if found non pregnant	Days required for PD	Productive days lost if not pregnant and not returning to oestrus	Loss to farmers in INR
UPR	63	123	162	27540
MPA	42	65	67	11390
TU	42	68	73	12410

in dairy cattle in Kerala, along with improved breeding activities. This will help the dairy farmers to maximize the benefits from the reproductive life of the dairy animals to improve their livelihood.

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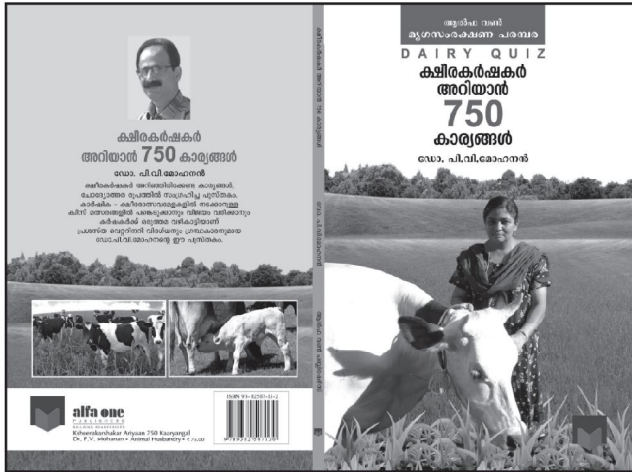
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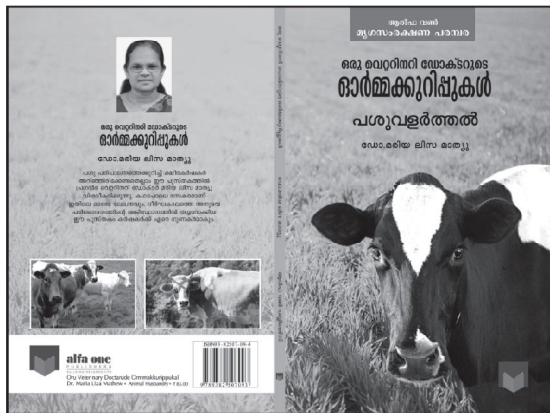
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BOOK REVIEW



KSHEERAKARSHAKARARIYAN 750 KARIYANGAL

The publication, 'Ksheerakarshakarariyan 750 kariyangal' written by Dr P V Mohanan, Assistant Project Officer RAIC Kannur has been released recently. This book contains 750 questions and answers covering all aspects of dairy farming. It would be helpful for the farmers who are participating in the Quiz programmes conducted by Dairy and Animal Husbandry Departments. Book is published by Alfaone publishers. Dr Mohanan has so far written 18 books including this.



ORU VETERINARY DOCTURUDAE ORMAKURIPPUKAL

'Oru veterinary docturudae ormakurippukal' written by Dr Mariya liza mathew, retired Joint director and well known writer has been released recently. This book covers all aspects of management of dairy farming. The author narrates facts in a readable format of storytelling. This book would be helpful for the dairy entrepreneurs. This book is published by Alfaone publishers. ❖