KNOWLEDGE OF FOOT AND MOUTH DISEASE AMONG DAIRY FARMERS IN THRISSUR DISTRICT AND THE CONSTRAINTS IN ADOPTING CONTROL MEASURES

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DECLARATION

I hereby declare that the thesis, entitled **"KNOWLEDGE OF FOOT AND MOUTH DISEASE AMONG DAIRY FARMERS IN THRISSUR DISTRICT AND THE CONSTRAINTS IN ADOPTING CONTROL MEASURES"** is a bonafide record of research work done by me during the course of research and that this thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

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CERTIFICATE

Certified that this thesis entitled **"KNOWLEDGE OF FOOT AND MOUTH DISEASE AMONG DAIRY FARMERS IN THRISSUR DISTRICT AND THE CONSTRAINTS IN ADOPTING CONTROL MEASURES"** is a record of research work done independently by Dr. Subin K.Mohan, under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.

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Dr. Subin K. Mohan

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ABBREVIATIONS

ADCP	-	Animal Disease control Project
AI	-	Artificial Insemination
BQ	-	Black Quarter
FMD	-	Foot and Mouth Disease
HS	-	Hemorrhagic Septicemia
PPR	-	Peste Des Petits Ruminants
RP	-	Rinderpest
WSHG	-	Women Self Help Group

INTRODUCTION

1. INTRODUCTION

Foot and Mouth Disease (FMD) is a highly infectious and acute viral disease of cloven hooved animals. Though, morbidity of the disease is extremely high yet mortality is low generally below two percent. Mortality may be as high as twenty percent in younger animals. Infected animals begin excreting the virus a few days before signs of the disease develop. The prevailing climatic condition and local topography determine the distance that the disease can spread and this may be considerable. Air borne spread of the disease takes place readily. Meat from the carcass of animals infected with FMD at the time of slaughter can transmit the virus. The disease can also be transmitted from one infected premises to another through the movement of in contact animals, vehicles, feed, fodder, bedding, clothes of workers and fomites.

The disease is rarely fatal except in the case of very young animals which may die without showing any symptoms. All affected animals lose condition and secondary bacterial infection may prolong convalescence. The most serious effects of the disease, however, are seen in dairy cattle. Loss of milk yield, abortion, sterility and chronic mastitis are common place (Mahajan *et al.*, 2001). Humans can also contract FMD infection from the animals. Human FMD is called Hand FMD and the symptoms are similar to influenza but with some blisters. It is a mild, short lived, self limiting disease in humans.

In India, FMD is endemic and occurs throughout the year in all parts of the country. The rate of annual incidence of FMD is as high as 15-20%. The high annual incidence rate leads to heavy economic losses both directly and indirectly due to drastic reduction in the draft capacity and export potential of all livestock products. The affected animals never regain their milk yield, which falls by even forty percent.

According to Bhat and Taneja (2001) the overall losses could be to the tune of more than 5000-8000 crores of rupees per year. Because of FMD, we are unable to export livestock products to more lucrative western market, though there is a demand. Pankaj *et al.* (2003) reported that if we control FMD, milk production can jump from 80 to 100 million tonnes per annum. Also the return from sale of meat especially buffalo meat can be increased by 3-5 tonnes, as the same produce will attract better price.

Farmers in Kerala have been facing great economic loss due to FMD every year. It is calculated that the economic loss due to death of animals in the state is Rs.63.33 lakhs and loss due to reduction in milk yield is Rs.121.5 lakhs (Vijayakumar, 1999). Under Kerala condition, most important loss is by virtue of reduction in milk yield. Milk yield is reduced to about 50%, or less. Besides, it reduces the meat value as well as the draft power. Years of valuable work done on the improvement of livestock can be undone in a short time by this disease. Besides, the state incurs large economic losses as a result of the inability to produce and ship processed animal products.

Oflate, FMD has assumed a greater significance and it has now been realized that unless this disease is effectively brought under control, little success can be expected in the livestock industry, especially dairy industry. Consumption of milk and meat reduces on account of consumer fear of contracting FMD. Although there is no scientific basis for this fear, the effect would be reduced consumption and further decrease in prices. FMD is a major constraint in India's participation in international trade of livestock and animal products. The presence of FMD can affect the export of other products, such as fresh fruit and vegetables to FMD free countries. FMD has a socio-economic impact also. It retards the labour potential of several economically weaker sections of the society, who depend on livestock production activities for their

daily bread. Moreover it creates a negative feeling among farmers, especially in the context of increasing production cost.

The above facts clearly points to the need for immediate and honest efforts to control this disease. Vaccination with a highly efficacious vaccine may be a cost effective strategy for the control of FMD if vaccinated animals are not subsequently slaughtered and there is no future adverse economic impact, such as trade restrictions (Bates *et al.*, 2003). Faced with the impossibility of realistic control within the financial and manpower resources available, many countries have taken up measures to reduce the incidence rather than eradication of FMD. But eradication of the disease through vaccination is the only choice in India because stamping out diseased animals is not possible due to socio-cultural and economic reasons.

The Government of Kerala took the stern decision to control this dreaded disease in the state by mass vaccination, identification of vaccinated animals by ear tagging, strict inspection of animals entering the state through the various check posts and verification of the certificate of vaccination against FMD through Animal Disease Control Project (Goraksha) implemented in 2004. Inspite of all these efforts, there were outbreaks of this disease in the state.

Scope of the study

Studies to understand the attitude, awareness and the constraints faced by livestock farmers on any livestock disease even those highly contagious and infectious diseases that shatter their livelihood are conspicuous by their absence. Not to speak of FMD. It is high time we understood the dairy farmers' feeling viz:- attitude, general awareness of FMD, constraints in adopting control measures as well as disease management. It is also worth knowing the difficulties faced by the technical personnel concerned with implementing control measures. Such information is of immense value to policy makers in planning appropriate extension education programmes.

FMD can be controlled effectively if the right attitude is inculcated, a strong awareness of it is created and farmers' difficulties in adopting control measures are removed. From the extension point of view, it is important to know what factors determine the dairy farmers' attitude and general awareness of FMD so that appropriate interventions could be planned. That apart, since the ADCP programme is in vogue and many veterinarians are functioning as implementing officers of FMD control measures, an understanding of their difficulties in undertaking control measures especially the door step FMD vaccination programme is of paramount importance. All such information is vital in planning and executing a package of holistic FMD control programme in the future. Thus considering the socio-economic significance of FMD and its control, the present study is undertaken and it will throw light on the dairy farmers' attitude towards FMD vaccination, awareness of FMD, difficulties in adopting control measures as well as the implementing officers' constraints in adopting control measures. Even so, the specific objectives of the study were

1) To study the general awareness of FMD and its control measures among the selected dairy farmers

2) To assess the constraints while implementing FMD control measures.

3) To study the determinants of training/ educational importance.

Limitations

Paucity of time, resources and even earlier research were serious limitations.

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

Review of literature are presented in the following heads

2.1 Socio-personal characteristics
2.2 General awareness
2.3 Attitude towards FMD vaccination
2.4 Constraints
2.5 Communication variables

2.1 SOCIO-PERSONAL CHARACTERISTICS

2.1.1 Age

Berzon (1978) made an analysis of animal bite epidemic in Baltimore, Maryland. He reported that the bite rate for the most susceptible age group (5-14 years) was 19 per 1000 population.

Sharma and Sharma (1993) reported that age of the livestock keepers had no significant influence on their understanding of contagious nature of diseases.

Singh *et al.* (2000) on their survey on community perceptions of jaundice in Delhi reported that age of the respondents had no significant bearing on the correctness of responses.

Bailey (2002) classified age into four categories- young (18-39), middle aged (40-59), older (60-74) and old-old (75 and above).

Benthem *et al.* (2002) in their study on knowledge and use of preventive measures related to dengue in Thailand showed that age of the respondents was significantly associated with the knowledge of dengue.

Koenraadt *et al.* (2006) in their study on dengue knowledge, practices and impact in Thailand reported that age of the respondents was significantly associated with the knowledge of dengue.

2.1.2 Herd Size

Sharma and Sharma (1993) reported that herd size of livestock keepers had no significant influence on their understanding of contagious nature of diseases.

Saliu *et al.* (2008) studied the adoption of vaccination and ethno veterinary treatment for PPR among sheep and goat farmers in Nigeria and reported that the more the number of sheep and goat kept, the more was the likelihood of adopting vaccines.

2.1.3 Experience in dairying

Narmatha *et al.* (1996) studied the knowledge level of farm women in scientific poultry farming and reported that medium level of knowledge of the farm women was due to medium experience in farming.

2.1.4 Education

Narmatha *et al.* (1996) studied the knowledge level of farm women in scientific poultry farming and reported that medium level of knowledge of the farm women is due to medium level of education.

Singh *et al.* (2000) conducted a survey on community perceptions of jaundice in Delhi. They reported that literate respondents were significantly more aware of jaundice, its symptoms, causes, dangers and prevention.

Rasania *et al.* (2002) studied the awareness and practices regarding malaria in Delhi. About 57% of the respondents were aware of the cause of malaria as parasite or mosquito and awareness increased with the literacy status.

Singh and Choudhary (2005) in a study on knowledge, attitude, behavior and practice study on dog bites in Gujarat reported that 86.6% individuals were aware about antirabies vaccine. Mostly they were educated and the difference between the literate and illiterate was highly significant.

Abbate *et al*. (2006) in their study on knowledge, attitudes and practices of avian influenza among the poultry workers of Italy reported that knowledge of avian influenza was greater in persons with more education and those who worked for a longer time.

Koenraadt *et al*. (2006) on a survey of dengue knowledge and practices and their impact on *Aedes aegypti* populations in Thailand reported that people with more formal education knew more about dengue than persons with less schooling.

Akinola *et al*. (2008) in a study on knowledge, attitudes and compliance of poultry workers with preventive measures for avian influenza in Nigeria reported that knowledge was greater in workers with more education.

Giuseppe *et al.* (2008) studied the knowledge of respondents towards avian influenza in an adult population of Italy and reported that respondents with lower educational level, didn't know the definition of avian influenza but they knew that

avian influenza could be transmitted by eating, touching raw eggs and poultry foods. Old respondents with a higher educational level and from higher socio-economic class were more likely to be knowledgeable about avian influenza.

Heffernan *et al.* (2008) studied the livestock vaccine adoption among poor farmers in Bolivia and reported that vaccination for FMD had a significant relationship with education, and respondents having more than five years of formal education level held positive views towards vaccination.

Saliu *et al.* (2008) studied the adoption of vaccination and ethno veterinary treatment for PPR among sheep and goat farmers in Nigeria and reported that education negatively contributed to the adoption of PPR vaccine.

2.1.5 Income

Oluwafemi (2009) studied the impact of African animal trypanosomiosis and tsetse fly on the livelihood and well-being of cattle and their owners in the Bicot study area of Nigeria and reported that 93% of respondents agreed that their income would increase if trypanosomiosis was controlled.

2.2 GENERAL AWARENESS

Sharma and Sharma (1993) reported that 56.6% of the livestock keepers do not know the contagious nature of diseases. Twenty two percent of the respondents do not know the names of the commonly occurring contagious diseases in the village. Thirty four percent and sixty percent were ignorant of the causes of HS and RP respectively. Sixty eight percent of the respondents were aware of all types of animals susceptible to HS. A large number of respondents (60%) were ignorant of the course of H.S and

86.7% of livestock owners from inundated area did not know the source of infection through which RP is introduced in the village.

Goswami and Sagar (1996) developed a cognitive learning scale to measure the knowledge levels of livestock owners about contagious diseases like HS, FMD and RP and vaccination against them.

Narmatha *et al.* (1996) studied the knowledge level of farm women in scientific poultry farming and reported that about three- fourth (74%) of the farm women possessed medium level of knowledge. The respondents have only 66% knowledge of disease control.

Thangavel *et al.* (1996) reported that nearly one-fifth of the respondents alone had correct knowledge of disease control measures in the areas; dry and wet. The level of knowledge with regard to disease control was found to be very poor in both the areas.

New *et al.* (1997) assessed the knowledge of veterinarians and their clients of Tennessee regarding heartworm preventives and vaccinations in dogs. The results showed that the expectations of veterinarians and clients regarding heartworm preventives were similar. Of clients purchasing heartworm preventives, 38% did not know that the medication was effective against intestinal nematodes. Most clients knew that annual vaccinations included distemper virus, parvo virus and rabies virus, but about half of them did not know that other antigens were in the vaccines.

Singh *et al.* (2000) in their study on community perceptions of jaundice in East Delhi reported that 77%, 39%, 18% and 17% people knew about the correct symptoms, dangers, causes and prevention of jaundice respectively.

Benthem *et al*. (2002) studied the knowledge and use of prevention measures related to dengue in northern Thailand. Of the 1650 persons, 67% had knowledge of dengue. Fever (81%) and rash (77%) were the most frequently mentioned symptoms.

George and Subhadra (2002) studied the impact of calf feed subsidy scheme on knowledge of women about disease control and reported that 38.6% of beneficiary women were highly knowledgeable of preventive vaccination as compared to non beneficiary women. None of the women studied knew the symptoms or vaccination schedule of HS and RP while more than half of them did not know the schedule of FMD vaccination.

Rasania *et al.* (2002) conducted a survey on awareness and practices regarding malaria in Delhi. Majority of the respondents knew that mosquito bred in water (62.9%), and mosquito breeding can be prevented (56.6%).

Srivasthava *et al.* (2002) studied the awareness and types of response of livestock owners about certain reproductive parameters of cross- bred cows and reported that 24.4 per cent of livestock owners were aware of age of onset of puberty in cross-bred heifers. It was revealed that percent awareness of livestock owners about appropriate time of A.I and interval between breeding of their cows was 42.18 and 38.02 respectively. The awareness of livestock owners on importance of confirmation of pregnancy was very low.

Hairi *et al*. (2003) conducted a cross sectional survey on knowledge, attitude and practice of dengue among the rural communities in Kuala Lumpur. It was found that knowledge of the community was good. There was significant correlation between knowledge of dengue and attitude towards Aedes control.

Paul *et al.* (2003) studied the knowledge and attitude of tribals regarding cross-bred cattle rearing in Udaipur district of Rajasthan and reported that more than half (58%) of the overall respondents were from medium knowledge category, followed by 24 per cent respondents who possessed high knowledge of cross-bred cattle rearing. Further 18 percent of the respondents had low knowledge of cross-bred cattle rearing.

Shashi *et al. (*2003) conducted a study to assess the knowledge and attitude of tribals regarding crossbred cattle rearing and reported that more than half of the overall respondents had medium knowledge of crossbred cattle rearing and also nearly two-third of them had favorable attitude towards crossbred cattle rearing.

Mitschler *et al.* (2004) studied the knowledge and prevention of tick bite borreliosis in Alsace. The existence of borreliosis is known to 74 % of the people, 63 % claimed that they were worried of the disease and 43 % knew that the first manifestation is redness spreading over the skin.

Adekoya (2005) studied the training needs of small scale poultry farmers on improved production techniques and reported that 86.7% of the respondents scored low marks in awareness of diseases/ parasites prevention and control respectively.

Jun (2005) found that regular vaccination cannot stop the development of the disease. He said that information campaigns about rabies should be strengthened and mass education on the treatment of dog bites and antirabies vaccination should be instituted to make the public aware.

Singh and Chander (2005) studied the FMD vaccination status of milch cattle and buffalo in Bareilly and reported that only 25.83% of farmers were aware of the schedule of FMD vaccination.

Koenraadt *et al.* (2006) on a survey of dengue knowledge and practices and their impact on *Aedes aegypti* populations in Thailand reported that 77% of the respondents cited Aedes mosquitoes as the main vector of dengue, and 67% knew that dengue vectors bite during the day.

Savitha *et al.* (2006) studied the awareness among livestock and abattoir workers of Central India about zoonotic diseases and vaccination and reported that approximately 80% of livestock workers were aware of the vaccination concept for preventing their livestock against dreaded diseases like FMD, HS, BQ and Anthrax. Shepherds were totally ignorant about vaccines. The knowledge of abattoir workers for vaccination was poor and majority of the workers (97%) were not having any idea about vaccine and vaccination. Awareness regarding zoonotic diseases among abattoir and livestock workers varied from 2.4% -50%. About 50% farm workers were aware of pox. Only 20% of surveyed shepherds had idea of rabies but not about any other zoonotic diseases.

Singh *et al.* (2006) in their study on knowledge, attitude and practices related to Kala-azar in Bihar reported that 97.4% of the respondents were aware of the disease. The infectious nature of the disease was known to 39.9%. Majority believed that Kala-azar spreads through mosquito bites.

Hopp *et al.* (2007) studied the Norwegian farmers' vigilance in reporting sheep showing scrapie- associated signs and reported that scrapie associated signs were correctly checked by 34% to 69% of the farmers. Approximately 2% of the farmers were not familiar with any scrapie- related symptoms.

Jegede *et al.* (2007) studied the traditional health care practices in disease prevention and control by small ruminant farmers in Nigeria and reported that only 10.26% of the respondents have the knowledge to identify livestock diseases by seeing signs or symptoms.

Kaewpitoon *et al.* (2007) studied the knowledge, attitude and practice related to liver fluke infection in north east Thailand. They reported that 55.11% of the population had a good level of knowledge concerning the mode of transmission and 79.72 % of the population had a good level of knowledge with regards to defecation and consumption.

Matibag *et al.* (2007) studied the knowledge, attitudes and practices of rabies in a community in Sri Lanka and reported that the majority of the sample population (89.6%) was aware that dogs are the main reservoir of rabies, rabies is fatal and rabies could be prevented by vaccination.

Akinola *et al*. (2008) studied the knowledge, attitude and compliance of poultry workers with preventive measures for avian influenza in Nigeria. Nearly all the respondents (92.9%) had heard about avian influenza infection. Only 61.4% of respondents correctly defined avian influenza as a viral infection that occurs in all species of birds. Knowledge of the transmission of disease varied: 72.9% knew that the disease could be transmitted from bird to bird, and 55% knew it could be transmitted from bird to human.

Giuseppe *et al.* (2008) reported the knowledge of respondents towards avian influenza in an adult population of Italy. Half the survey respondents correctly defined avian influenza as a contagious disease caused by virus and 20.1% to 81.4% knew the different modes of transmission. More than half of the respondents thought that avian influenza was a serious disease (61.9%) and it was possible to prevent it (53.3%).

Heffernan *et al.* (2008) studied the livestock vaccine adoption among poor farmers in Bolivia and reported that only 46% of farmers named a livestock disease

for which a vaccine exists ie, Anthrax, FMD, Newcastle disease, Rabies or Swine Fever.

Menezes (2008) opined that public health educational programmes are needed to create awareness both in medical community and in the public regarding the dangers of inadequately managed animal bites.

Olaniyi *et al.* (2008) studied the constraints to utilization of poultry production technology among farmers in Oyo state, Nigeria and reported that farmers have awareness in management practices like vaccination (78.8%), control of pests and diseases (88.9%) and deworming (64.8%).

Saliu *et al.* (2008) studied the adoption of vaccination and ethno veterinary treatment for PPR among sheep and goat farmers in Nigeria and reported that more than 70% of the respondents are aware of the ability of vaccine to prevent PPR disease. About 60% of the farmers do not have adequate knowledge of the vaccine.

Wasay et *al*. (2008) conducted one survey in Karachi. He reported that 25% of the general practitioners had correct knowledge about pre-exposure and 13% had correct knowledge about both pre and post exposure tetanus immunization.

Oluwafemi (2009) studied the impact of African animal trypanosomiosis and tsetse fly on the livelihood and well-being of cattle and their owners in the Bicot study area of Nigeria and reported that 82.2% respondents were aware of disease(s) or conditions that usually affect their cattle. Eighty percent of respondents were familiar with tsetse and trypanosomiosis and 89.2% of the respondents were aware of the negative impact of African animal trypanosomes and its vector on their livelihood and well-being of the cattle.

2.3 ATTITUDE TOWARDS VACCINATION

Katz and Stotland (1959) developed the idea that people hold and express particular attitudes because they derive psychological benefit from doing so, and the type of benefit varies among the individuals.

Sagar and Kunzuru (1993) developed a scale to measure livestock owners' attitude towards vaccination and reported that more favourable the attitude of a respondent towards the practice, the greater is the adoption of that practice by the respondent. The correlation coefficient between the adoption of vaccination against contagious diseases by the livestock owners and their attitude towards animal husbandry practices were calculated and were found significant.

Little *et al.* (2000) studied the cattle producers' attitude towards alternative production and marketing practices and reported that majority of the survey respondents had positive attitude towards vaccination and only 8% of the survey respondents indicated that they never vaccinate their cattle.

Sasidhar *et al*. (2001) studied the attitude of livestock owners towards vaccination programme in order to develop and formulate suitable animal husbandry extension programmes and strategies. It was found that 42.5% of respondents had favorable attitude towards vaccination programme.

Paul *et al.* (2003) studied the knowledge and attitude of tribals regarding cross-bred cattle rearing in Udaipur district of Rajasthan and reported that nearly two third of the sampled tribals rearing cattle, had favourable attitude towards cross-bred cattle rearing.

Adekoya (2005) studied the training needs of small scale poultry farmers on improved production techniques reported that 69.9% of the respondents showed favourable attitude towards improved poultry production practices in the study area.

Singh and Chander (2005) studied the FMD vaccination status of milch cattle and buffalo in Bareilly and reported that there was a fear among farmers about fever, less milk yield etc after vaccination.

Roy *et al.* (2006) studied the constraints as perceived by the farmers in the adoption of dairy farming practices in Burdwan District of West Bengal and reported that 43.75% of respondents did not have faith in modern veterinary medicine.

Sankhala *et al.* (2006) studied the constraints faced by dairy entrepreneurs in adoption of improved dairy farming practices and reported that farmers have a positive attitude towards vaccination and there is an inadequate supply of vaccines like FMD and HS even on payment and this was reported by 28.57% respondents.

Savitha *et al.* (2006) studied the awareness among livestock and abattoir workers of Central India about zoonotic diseases and vaccination and reported that they had a positive attitude towards vaccination and 67% were regularly vaccinating their animals.

Matibag *et al.* (2007) studied the knowledge, attitudes and practices of rabies in a community in Sri Lanka and reported that 76% of the respondents of a community of Sri Lanka had vaccinated their pets against rabies.

Bock *et al.* (2008) studied the views of beef producers in the *Boophilus microplus* endemic area of Queensland on the control and vaccination against tick fever and reported that out of the beef producers, who did not use the vaccine, over

70% replied that there was no need to vaccinate because of the low risk of the disease in their herds.

Heffernan *et al.* (2008) studied the livestock vaccine adoption among poor farmers in Bolivia and reported that there was a low uptake of livestock vaccination among poor farming communities in Bolivia. This uptake of livestock vaccination was unlikely to improve without knowledge transfer. Negative impacts of believes such as lameness or ill health after vaccination affects vaccine adoption. Group membership appeared to foster greater levels of participant opinions regarding vaccination. Vaccination for FMD had a significant relationship with education and respondents having a more than five years of formal education level held positive views toward vaccination

Prathab and Ponnusamy (2008) studied the factors influencing the attitude of farmers of Tamil Nadu towards rabbit farming and reported that majority of the respondents possessed favourable attitude towards rabbit rearing and this may be because the respondents were convinced of the benefits of rabbit rearing.

Saliu *et al.* (2008) studied the adoption of vaccination and ethno-veterinary treatment for PPR among sheep and goat farmers in Nigeria and reported that farmers had positive attitude towards the use of PPR vaccination.

2.4 CONSTRAINTS

Venkatasubramanian and Fulzele (1996) also reported that main constraints relating to disease control/prevention were the cost of veterinary services, inadequate knowledge of disease symptoms, and inadequate services of veterinary institutions.

Adekoya (2005) studied the training needs of small scale poultry farmers on improved production techniques and reported that one of the major constraints experienced by the respondents was that related to medical area of poultry keeping.

Ocadio *et al.* (2005) studied the major constraints to livestock production, livestock diseases, parasites and vectors in Soroti district and reported that diseases were the major constraints to livestock production.

Singh and Chander (2005) studied the FMD vaccination status of milch cattle and buffalo in Bareilly and reported that illiteracy among farmers, myth related to after-effects of vaccination and lack of infrastructure were the constraints faced by doctors in implementing successful vaccination programme. Twenty percent doctors said that due to cost factor involved, farmers did not come forward for vaccination and 49.16% respondents reported the lack of money to afford vaccine cost.

Mavi *et al.* (2006) studied the constraints in adoption of improved dairy farming practices by dairy farmers of Punjab and reported that 54.29 percent of the respondents felt the unavailability of the veterinary services during night time as one of their major constraints. High cost of veterinary medicine was also a constraint (51.43%). The charge of veterinarians was also high as reported by 41.43% of the respondents.

Roy *et al.* (2006) studied the constraints as perceived by the farmers in the adoption of dairy farming practices in Burdwan District of West Bengal and reported that communication gap was a major constraint. Animal Hospitals were far away from the villages. This was also an important constraint which was faced by the majority of the dairy farmers. Nearly half (43.75%) of the respondents did not have faith in modern veterinary medicine. Regarding the high cost of treatment, 59.37 % respondents reported it as a major constraint in case of health care practices. High

cost of the treatment was referred as a major constraint, as most of the respondents belonged to the medium or low income group: hence, they were unable to afford it. Ignorance and relying in indigenous method was the main constraints in case of deworming technique, as reported by 72.29%.

Sankhala *et al.* (2006) studied the constraints faced by dairy entrepreneurs in adoption of improved dairy farming practices and reported that majority of the respondents' i.e. 51.43% had the constraints of inadequate/non-availability of veterinary services during the night. The inadequate supply of vaccines like FMD and HS even on payment was reported by 28.57% respondents as a constraint for taking care of animals.

Olaniyi *et al.* (2008) studied the constraints with utilization of poultry production technology among farmers in Oyo state, Nigeria and reported that age, awareness of technology and education were negatively related with the constraint education. Information sources were positively and significantly related to constraints. The major constraints were inadequate assess to capital (65%), inadequate extension contact (55%), inadequate information (27.5%), inadequate input supply (15%) and in marketing of products.

Saliu *et al.* (2008) studied the adoption of vaccination and ethno-veterinary treatment for PPR among sheep and goat farmers in Nigeria and reported that inadequate knowledge of the vaccine was the major constraint in adopting PPR vaccine. The farmer might pay extra cost to locate the veterinary agents where the agents were very few. Unavailability and high cost of the vaccine also served as major constraints.

Oluwafemi (2009) studied the impact of African animal trypanosomiosis and tsetse fly on the livelihood and well-being of cattle and their owners in the Bicot study

area of Nigeria and reported that 83% of the respondents usually treat their cattle against trypanosomiosis and they believed that the treatment charges were expensive.

2.5 COMMUNICATION VARIABLES

Raizada and Grover (2000) studied the gain in knowledge in consumer literacy through media package and reported that there is a significant gain in mean score of knowledge from pre to post exposure stage.

Singh and Kaul (2002) reported that communication of the message was effective in changing the attitude of the live stock owners towards artificial insemination in the favorable direction.

Adekoya (2005) studied the training needs of small scale poultry farmers on improved production techniques reported that seminars and workshops should be regularly organized for poultry farmers to beef up their knowledge and skill in business.

Abbate *et al.* (2006) reported that greater knowledge of avian influenza was observed in those who received information from health professionals and employers in Italy.

Matibag *et al.* (2007) studied the knowledge, attitudes and practices of rabies in a community in Sri Lanka and reported that people from the rural areas obtained the information on rabies mostly from government vaccination campaigns.

Bock *et al.* (2008) studied the views of beef producers in the *Boophilus microplus* endemic area of Queensland on the control of and vaccination against tick

fever and reported that private veterinarians were regarded as the most important source of information on vaccines for cattle followed by a weekly rural newspaper.

Giuseppe *et al.* (2008) reported that almost all respondents recalled receiving some information about avian influenza (97.9%) through mass media (85.8%), health professionals (26.5%) and scientific journals (8.4%). A majority (65%) reported interest in receiving further information on avian influenza.

Menezes (2008) opined that public health educational programmes are needed to create awareness both in medical community and in the public regarding the dangers of inadequately managed animal bites.

Olaniyi *et al.* (2008) studied the constraints to utilization of poultry production technology among farmers in Oyo state, Nigeria and reported that about half (49.1%) of the sampled farmers indicated extension agents and veterinary doctors as their source of information followed by radio and television (16.7%).

METHODOLOGY

3. METHODOLOGY

The methodology of the study is presented under the following headings

3.1 Area of study and selection of the study sample
3.2 Selection of variables
3.3 Operationalization and measurement of variables
3.4 Statistical analysis

3.1 AREA OF STUDY AND SELECTION OF THE STUDY SAMPLE

Thrissur district is one of the central districts of Kerala. The study was conducted in the three panchayats of this district namely Chazhoor, Anthikkad and Paralam where epidemics of FMD were reported in the year 2007. Two groups of dairy farmers were selected applying stratified random sampling technique. A sample of sixty dairy farmers who had experienced FMD in their cattle were proportionately and randomly selected from the milk co-operatives of these panchayats and another sample of sixty dairy farmers who haven't had the experience of FMD in their cattle were also randomly selected from these milk cooperatives. Descriptive research design was employed for the study.

Fig. 1. THRISSUR DISTRICT

MAP SHOWING PANCHAYATHS SELECTED FOR THE STUDY

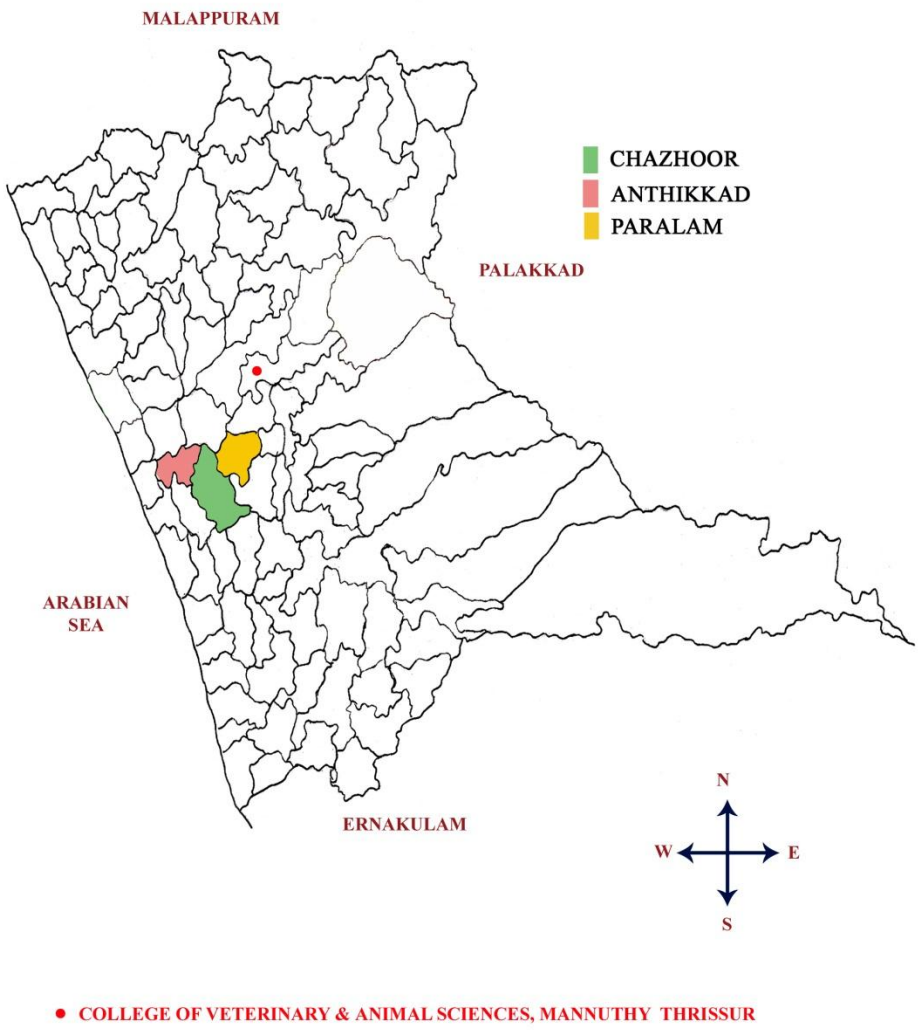
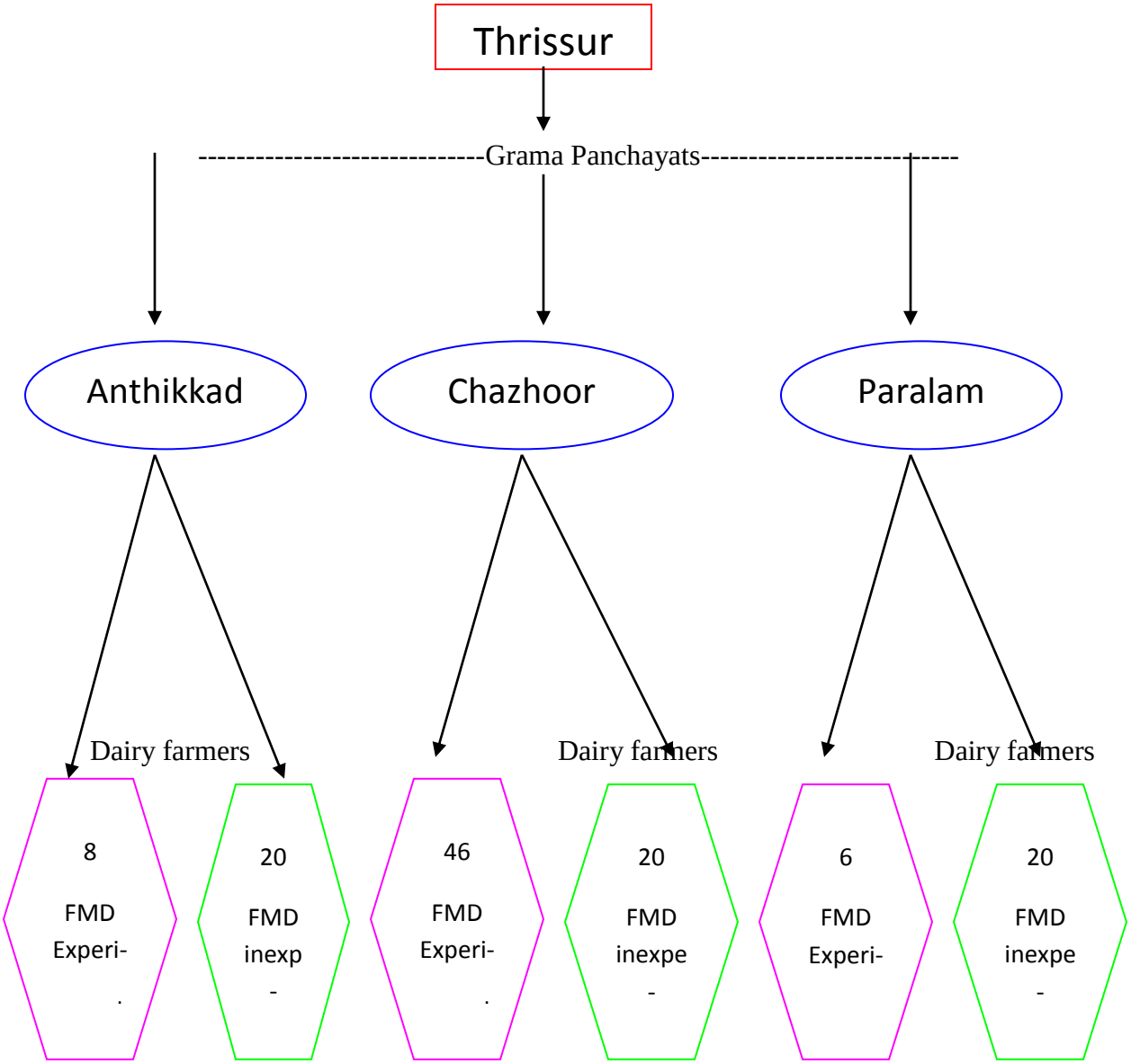


Fig 2. Sampling procedure


Thrissur
----------Grama Panchayats----------
Anthikkad
Chazhoor
Paralam
Dairy farmers
Dairy farmers
Dairy farmers
8
FMD
Experi-
.
20
FMD
inexp
-
46
FMD
Experi-
.
20
FMD
inexpe
-
6
FMD
Experi-
20
FMD
inexpe
-

3.2 SELECTION OF VARIABLES	MEASURING TOOL

A) Independent variables

I. Socio personal variables

1. Age	Schedule developed
2. Experience in dairying	-do-
3. Literacy/ Educational status	-do-
4. Herd size	-do-
5. Occupation	-do-
6. Income from dairying	-do-

II. Communication exposure

1. Media exposure	Schedule developed
2. Interpersonal channels	-do-
3. Seminars / workshops attended	-do-

B) Dependent variables

1. Attitude towards FMD vaccination	Scale developed
2. General awareness of Foot and Mouth Disease	Knowledge test developed
a) Awareness of symptoms and transmission	
b) Awareness of first aid and disease management	
c) Awareness of prevention and control	

C) Constraints

1. Constraints in adopting control measures	Delphi technique (modified)
2. Constraints in disease management	-do-
3. Implementing officers' constraints while undertaking FMD control measures.	Open ended schedule

3.3 OPERATIONALISATION AND MEASUREMENT OF VARIABLES

3.3.1 Independent variables

3.3.1.1 Socio personal variables

3.3.1.1.1 Age

Age means the chronological age of the respondent at the time of interview. The respondents were categorized as follows (Bailey, 2002).

Sl no	Category
1	Young (18-39 years)
2	Middle (40-59 years)
3	Old (60-74 years)
4	Old-old (75 and above)

3.3.1.1.2 Experience in dairying

Experience in dairying means to the number of years that the respondent was exposed to dairying

3.3.1.1.3 Education

Education means the level of formal education. Accordingly, respondents were categorized as follows.

Sl No	Category	Score
1.	Illiterate	1
2.	Primary	2
3.	School level	3
4.	Pre-degree/ Plus two	4
5.	Degree	5
6.	Post graduate	6

3.3.1.1.4. Herd size

Herd size indicated the number of dairy cattle possessed by the dairy farmer at the time of study.

3.3.1.1.5 Occupation

Occupation means the job / profession of the respondent. The profession that took away much of the time in a month or year was considered to be the major occupation. Other occupations were considered as subsidiary.

Sl No	Category	Score
1.	Petty jobs (Toddy taping, Cooli, Driver)	1
2.	Agriculture	2
3.	Cattle rearing	3
4.	Business	4
5.	Services (Private, Govt., Gulf)	5

If there is no subsidiary occupation, the score was given as 0

3.3.1.1.6 Income from dairying

Income from dairying refers to the annual earning of the respondent from dairy cattle.

3.3.1.2 Communication variables

3.3.1.2.1. Media exposure

Media exposure means the degree of the respondents' exposure to print media such as news paper, magazines, posters, leaflets and electronic media such as radio and television.

Preference for media communication sources

Preference for media communication sources means the respondents' choice of communication media such as print and electronic media. Each respondent was asked to rank seven common communication sources by giving first rank to the most preferred and last rank to the least preferred. The rank obtained for each source from each respondent was converted into scores based on the following method.

Rank	Score
I	7
II	6
III	5
IV	4
V	3
VI	2
VII	1

A total score of each source, over all the respondents was worked out and depending on this source wise total score; the sources studied were ranked from one to seven (Pradeep, 2000). Further, since the total score of a source can range from 120 to 840, three class intervals were fixed as follows

Class intervals	Preference
120-360	
Low	
361- 600	
Medium	
601-840	
High	

3.3.1.2.2. Inter personal channels

Interpersonal channels refer to the tendency of the respondent to be in contact with localilte channels viz. neighbours and friends for information and cosmopolite channels viz. veterinary surgeons, traditional veterinary practitioners, livestock inspectors, inseminators, milk society employees and WSHG members.

Preference for interpersonal communication sources

Preference for interpersonal communication sources means the respondents' choice of interpersonal communication sources such as neighbours, friends, veterinary surgeons, traditional veterinary practitioners, livestock inspectors, inseminators, milk society employees and WSHG members. Each respondent was asked to rank eight common interpersonal communication sources by giving first rank to the most preferred and last rank to the least preferred one. The rank obtained for each source from each respondent was converted into scores based on the following method.

Rank	Score
I	8
II	7
III	6
IV	5
V	4
VI	3
VII	2
VIII	
1	

A total score of each source, over all the respondents was worked out and depending on this source wise total score, the sources studied were ranked from one to eight (Pradeep,2000). Further, since the total score of a source can range from 120 to 960, three class intervals were fixed as follows

Class intervals	Preference
120-400	
Low	
401-680	
Medium	
681-960	
High	

3.3.1.2.3 Seminars/workshops attended

Seminars and workshops attended means the tendency of the respondent to attend seminar / group discussions/ lecture classes about FMD.

3.3.2 Dependant variables

3.3.2.1 *Attitude towards FMD vaccination*

Thurstone (1946) defined attitude as the positive and negative affect asssociated with a psychological object. For the purpose of the study, attitude is conceptualised as an important psychological determinant of the respondents' behaviour in vaccinating his livestock against FMD.

A scale was constructed following the method of summated ratings (Likert, 1932) to measure dairy farmers' attitude towards FMD vaccination. A total of thirty six statements reflecting the attitude of dairy farmers towards FMD vaccination were prepared after reviewing literature, discussing with subject matter specialists, progressive dairy farmers and experienced field veterinarians (Appendix III). Due care was taken to cover all the relevant aspects of FMD vaccination. The statements initially prepared were edited as per the criteria prescribed by Edwards and Kilpatrick (1969).

All the statements were administered to thirty livestock farmers. This group consisted of randomly selected members and was altogether different from those chosen for the final study. These farmers were asked to indicate their degree of favourableness or unfavourableness towards each statement and the responses were recorded on a five point continuum as strongly agree, agree, undecided, disagree and strongly disagree with weightages four, three, two, one and zero respectively for favourable or positive statements. For unfavourable or negative statements, the scoring system was reversed. The total score for each respondent was obtained by adding the weightage given for each individual item. The attitude statements included both positive and negative ones. The scores of various respondents were arranged in descending order. Thirty percent of the respondents with the highest scores and thirty percent of the respondents with the lowest scores were taken for calculating 't' values, i.e nine respondents with the highest

total score (high group) and nine respondents with the lowest total score (low group) were selected as criterion groups in terms of which to evaluate the individual statements.

The ‘t’ values of the statements were calculated using the formula;

$$t = \frac{X_H - X_L}{\sqrt{\frac{S_H^2}{nH} + \frac{S_L^2}{nL}}}$$

where,

X_H= the mean score on the given statement for the high group

X_L= the mean score on the given statement for the low group

S_H^2= the variance of the distribution of responses of the high group to the statement

S_L^2= the variance of the distribution of responses of the low group to the statement.

nH= the number of subjects in the high group

nL= the number of subjects in the low group.

The ‘t’ value indicated the extend to which a statement differentiated between the high and low groups. These ‘t’ values were arranged in descending order and twelve statements with the highest ‘t’ values ie more than or equal to 3.47, were chosen for the final scale. The ‘t’ values of all the thirty-six statements are given in Appendix III. The final scale items are given in Table 1.

Table 1. Final scale items to measure attitude of dairy farmers towards FMD vaccination.

No	Attitude statements	SA	A	UD	D	SD
1	I think all susceptible livestock species should be vaccinated to effectively control FMD (+)	4	3	2	1	0
2	I don't prefer to vaccinate my calves as it may cause lameness (-)	0	1	2	3	4
3	I should not give FMD vaccination since it may lower milk yield (-)	0	1	2	3	4
4	I believe that vaccinated animals cannot contract FMD (+)	4	3	2	1	0
5	I should abstain from FMD vaccination as calves may die of it (-)	0	1	2	3	4
6	I am prepared to face the consequences of not vaccinating against FMD (-)	0	1	2	3	4
7	Though I stay and keep the livestock in an isolated place, vaccination is relevant (+)	4	3	2	1	0
8	I don't prefer to vaccinate my livestock against FMD as it may cause fever (-)	0	1	2	3	4
9	I believe in the natural resistance of animals to diseases rather than in vaccination (-)	0	1	2	3	4
10	It is due to Governments' compulsion that I vaccinate my livestock (-)	0	1	2	3	4
11	I abstain from FMD vaccination as it may cause swelling at the site of vaccination (-)	0	1	2	3	4
12	I would prefer FMD vaccination if only it is free of cost (-)	0	1	2	3	4

SA- Strongly agree **A**- Agree **UD**-Undecided **D**-Disagree **SD**-Strongly disagree

Reliability of the scale

The reliability of the test was found out by split half method. The test was administered to thirty dairy farmers and responses were obtained. Later the odd–even items were separated and the correlation value r' was computed. Since the split half test was applied, correction of r value was done employing Spearman Brown prophecy formula.

$$r = \frac{2r'}{1+r'}$$

r = reliability coefficient

r' = correlation coefficient

The reliability coefficient was found to be 0.95, which indicated that the test was internally consistent.

Validity of the scale

The validity of the scale was assured by selecting the scale items after due consultation with experts and referring to relevant literature.

Administration of the scale

The scale was administered to all the respondents. The respondents were required to record their positive or negative affect on the five point continuum viz:- strongly agree, agree, undecided, disagree and strongly disagree. Based on the total scores obtained, the respondents were categorized following Dalenius Hodges cumulative root F method into three groups namely favorable, neutral and unfavorable.

3.3.2.2 *Knowledge of FMD*

Knowledge, as defined in this study, included those behaviours and test situations which emphasised the remembering either by recoginition or recall of ideas, material or phenomenon (Bloom *et al.*, 1956)

The variable indicated the extend of awareness knowledge the respondents possessed at the time of the interview as evident from his or her responses to a set of questions scientifically prepared for this purpose.

Procedure followed for developing knowledge test

Item collection

The content of knowledge test battery was composed of questions (items). An item pool of questions was prepared by reviewing literature, refering textbooks and conducting discussions with subject matter specialists and field extension personnel. Finally, a through scrutiny of the item pool was done with the assistance of subject matter specialists. The questions were designed to test the knowledge level of dairy farmers about FMD. The items were collected regarding symptoms & disease transmission, first aid & disease management and prevention & control at the time of disease outbreak.

Initial selection of items for pretesting/ pilot study

The selection of items was done on the basis of the following criteria:-

1) It should promote thinking rather than rote memorisation.
2) It should differentiate the well- informed respondents from the poorly informed ones and should have a certain difficulty value.

The procedure adopted in selecting test items was on the lines used by Lindquist (1951), Jaiswal (1965), Moulik (1965), Jha and Singh (1970), Sagar (1983) and Goswami (1987).

A total of 72 items were initially constructed for item selection. These 72 items were selected based on the relevancy rating, from an item pool of 88 items which were delivered to a group of 20 subject matter specialists of various fields of animal health, livestock management and field extension personnel. Each item was rated into four

classes which were scored on a four point continnum viz. 4 (very relevent), 3 (relevant), 2 (somewhat relevant) and 1 (irrelevant), keeping in mind the aforesaid two criteria. The maximum and minimum achievable scores for an item were 80 and 20 respectively. Those items that scored more than or equal to 50 marks were selected for the construction of knowledge test. All the items collected for the construction of the knowledge test were in the objective form. The questions were true, false and don't know items and multiple choice ones, involving impersonnel and objective assessment.

Item analysis

Guilford (1954) pointed out that the item analysis of the test usually yields two kinds of information, item difficulty and item dicrimination. The index of item difficulty reveals how difficult an item is where as the index of item discrimination indicated the extend to which an item discriminates the well informed individuals from poorly informed ones.

The initially prepared seventy two items were checked and modified on the basis of pretesting and administered to a group of sixty respondents prior to the preparation of the final schedule. These groups were randomly selected dairy farmers and were altogether different from those chosen for the final study.

Each one of the respondents to whom the initial items of the knowledge test was administered gave the score of 1 or 0 for each item according to whether the answer was right or wrong. The total of correct answers given by the respondent over all the items in a particular knowledge test was the knowledge score obtained by him. The range of obtainable scores for a respondent was from zero to 72. After calculating this score of sixty dairy farmers, scores were arranged in the decending order.

Sixty respondents to whom a particular item pool of practices was administered was divided into 6 equal groups, each having 10 respondents. These groups were named as G1, G2, G3, G4, G5 and G6, respectively. Farmers' scores in each group were arranged in descending order according to the total score obtained by each one of them. Only four extreme groups with high and low scores were considered for computation of item difficulty and item discrimination indices.

Calculation of difficulty index

The difficulty index of an item is defined as the proportion of respondents giving correct answers to that particular item.

This was calculated by the formula,

$$P_i = \frac{n_i \times 100}{N_i}$$

Where P_i = difficulty index in percentage of the ith item.

n_i = total number of respondents giving correct answers to the i th item

Ni = total number of respondents to whom i th item was administered.

The difficulty indices of all the items included for the pretest of the knowledge test on FMD were calculated separately.

Calculation of the difficulty index of item no.1 (appendix II) of the knowledge test about FMD is shown below as an example:

$$P_i = \frac{n_i \times 100}{Ni}$$

$$= \frac{46 \times 100}{60}$$

$$= 76.66$$

Calculation of discrimination index

The method as suggested by Mehta (1958) was adopted. The formula where by item discrimination index was calculated is given below,

$$E1/3 = \frac{(S1 + S2) - (S5 + S6)}{N/3}$$

Where as,

S1, S2, S5 and S6 indicated frequencies of correct answers given by the respective sub group of the respondents ie. G1,G2, G5 and G6 respectively for an item in the test.

N = Total number of respondents to whom the item was applied.

Discrimination index of item No.1 (Appendix II) knowledge of FMD is shown below.

$$E1/3 = \frac{(S1 + S2) - (S5 + S6)}{N/3}$$

$$= \frac{(10 + 10) - (4 + 8)}{60/3}$$

$$= \frac{20 - 12}{20}$$

$$= 0.4$$

Selection of items for the knowledge test

Two criteria viz item difficulty and item discrimination indices were considered for the selection of items in the final format of the knowledge test. The underlying assumption in the statistics of the item difficulty was that the difficulty was linearly related to the level of the individuals knowledge. When a respondent answers an item correctly, it was assumed that the item was less difficult than his ability to cope up with it. In the present study items with difficulty index ranging from 30 to 82 and discrimination index of above 0.3, were included in the final format of the knowledge test, which fulfilled both criteria. The knowledge test comprised of twenty eight items.

Content validity of the knowledge test

The content validity of the knowledge test was ensured by choosing items in consultation with various subject matter specialists.

Reliability of the Knowledge test

The reliability of the test was found out by split half method. The test was administered to sixty dairy farmers and their responses were obtained. Later the odd–even items were separated and the correlation value r' was computed. Since the split half test was applied, correction of r value was done applying Spearman Brown prophecy formula.

$$r = \frac{2r'}{1+r'}$$

r = reliability coefficient

r' = correlation coefficient

The reliability coefficient was found to be 0.9944, which indicated that the test was internally consistent.

Scoring method

The summation of scores for correct replies over all the items included in the final format of the knowledge test, of the particular respondent indicated his level of knowledge. The range of scores was from zero to twenty eight in the knowledge test for FMD.

Mean scores for each item in the final format of the knowledge test was calculated using the formula:

$$\text{Mean score} = \frac{\text{Number of correct responses}}{\text{Number of respondents}}$$

Mean score for each domain was calculated using the formula:

$$\text{Mean score of a domain} = \frac{\text{Total score}}{\text{Number of respondents} \times \text{Number of statements}}$$

General awareness

General awareness means awareness across all the three domains viz: - awareness of symptoms and transmission, awareness of first aid and disease management and awareness of prevention and control.

Overall general awareness

Overall general awareness means general awareness of FMD experienced and inexperienced dairy farmers put together.

3.3.3 Constraints

3.3.3.1 *Constraints in adopting control measures and constraints in disease management*

Delphi methodology was employed to study the constraints in adopting control measures and constraints in disease management. Brown (1968) points out that, "The Delphi method is a name that has been applied to a technique used for elicitation of opinions with the object of obtaining a group response of a panel of experts. Delphi replaces direct confrontation and debate by a carefully planned, orderly programme of sequential individual interrogations usually conducted by questionnaires. The series of questionnaires is interspersed with feedback derived from the respondents. The technique puts the emphasis on informed judgment. It attempts to improve the panel or committee approach by subjecting the views of individual experts to each others criticizing in ways that avoid face to face confrontation and provide anonymity of opinion and of arguments advanced in defense of theses opinions"

Phases of Delphi

There are six phases that can be identified in the communication process that is taking place. These are

1) Formulation of the issue- What is the issue that really should be under consideration? How should it be stated?

2) Exposing the opinions- Given the issue what are the policy options available.

3) Determining the initial position on the issue- which are the ones everyone already agrees upon and which are the unimportant ones to discard. Which are the ones exhibiting disagreement among the respondents?

4) Exploring and obtaining reasons for the disagreements- what underlying assumptions, views or facts are being used by individuals to support their respective positions?

5) Evaluating the underlying reasons- How does the group view the separate arguments used to defend various positions and how do they compare to one another on a relative basis?

6) Revaluating the options. Revaluation is based on the views of the underlying evidence and the assessment of its relevance to each position taken.

In principle, the above process would require six rounds. This is simplified into three rounds by utilizing the following procedure.

1) Devoting considerable amount of time to carefully perform the obvious issues.

2) Sending the list with an initial range of options but allowing for the respondents to add to the list.

3) Asking for the position on an item and underlying assumptions in the first round.

Application of Delphi method

In this study, the delphi procedure was followed with modifications. It had three steps for the identification of constraints. To study the constraints in adopting control measures and constraints in disease management thirty dairy farmers each were randomly selected, which were sub samples of the final respondents under study. Both FMD experienced and inexperienced dairy farmers were selected for analyzing the constraints in disease management. FMD inexperienced dairy farmers were asked only of the constraints in adopting control measures.

Step 1

In this phase, the respondents were asked to list those major constraints they felt important in adopting control measures and disease management during the outbreak of FMD. Data were collected through personal interview.

Step 2

All the constraints obtained during the first phase were pooled and again fed to all the categories of respondents. Data were collected from the dairy farmers using a structured questionaire (Appendix IV). They were asked

1) To state their agreement or diagreement to all the expressed constraints.
2) To state if there is any change in their earlier responses.
3) To list out the cause(s) of the reported constraints contained in the list.
4) To list out the probable solutions for the constraints reported and
5) To list out any other constraint(s) which is/ are not in the list.

In this round, the judges become sequential analysers by breaking up the constraints into more specific, causal constraints. Each one of the respondent to whom the initial items of the constraint analysis test was administered gave the score 1 or 0 for each item according to whether they agree or disagree with the constraints. The total of agreed constraints given by the respondent over all the items in a particular test was scored. The range of obtainable scores for a respondent was from zero to 30. Those constraint statements which lies in the majority side ie more than or equal to ten were selected for the final study in phase three. A total of six constraints in adopting FMD control measures and eight constraints in disease management were selected accordingly.

Step 3

In this step, sixty FMD experienced dairy farmers were asked to rank any three constraints in disease management where as all the one hundred and twenty respondents were asked to rank any three constraints in adopting FMD control measures by giving first rank to the most preferred and last rank to the least preferred one.

The rank obtained for each constraint from each respondent was converted into scores based on the following method.

Rank	Score
I	3
II	2
III	1

Based on the total scores obtained, the constraints were ranked.

3.3.3.2 ***Constraints of implementing officers while undertaking FMD control measures***.

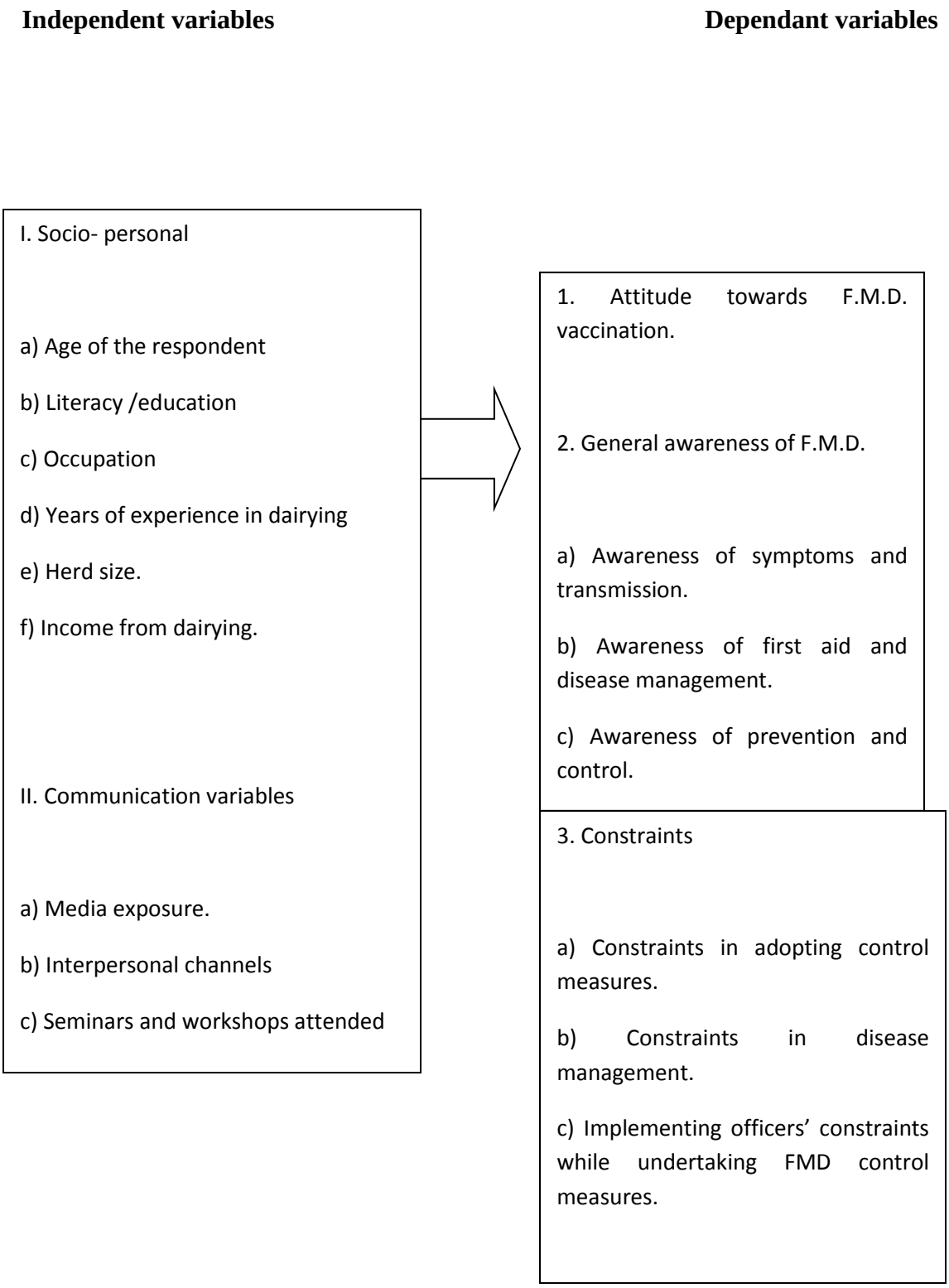
Constraints were known from a group of thirty veterinary surgeons who were working as implementing officers of ADCP in the State Animal Husbandry department and thereafter left the organization to join Kerala Agricultural University. The constraints expressed by this purposively selected sample of respondents were considered fair and frank or unbiased. Open ended schedule technique was applied to know the constraints. Depending upon the percentage of respondents, agreeing to a constraint it is categorized as a most relevant (>66%), relevant (33-66%) or less relevant (< 33%) constraint.

3.4. STATISTICAL ANALYSIS

The data were analyzed using the following statistical techniques

1. Frequency
2. Percentage
3. Mean
4. Dalenius and Hodges cumulative root F method
5. Z-test
6. Correlation
7. Multiple regression

Fig 3. Conceptual model of the study



RESULTS

4. RESULTS

The results of the study are presented under the following headings:

4.1 Independent variables

4.2 Dependent variables

4.3 Relationship between independent and dependent variables

4.1 INDEPENDENT VARIABLES

4.1.1 Age

Table 2. Distribution of dairy farmers based on age

n = 120

Sl.No.	Category	f	%
1	Young (18-39)	20	16.66
2	Middle (40-59)	59	49.17
3	Old (60-74)	36	30
4	Old-old (75 and above)	5	4.17

Data in table 2 showed that about one half of the dairy farmers (49.17%) belonged to middle age group followed by old age group (30%), young age group(16.66%) and old -old age group (4.17%).

4.1.2 Experience in dairying

Table 3. Distribution of dairy farmers based on experience in dairying.

n=120

Sl.No.	Category	f	%
1	Low (<24 y)	52	43
2	Medium (25-40 y)	45	38
3	High (>41y)	23	19

Fig.4 Distribution of dairy farmers based on age.

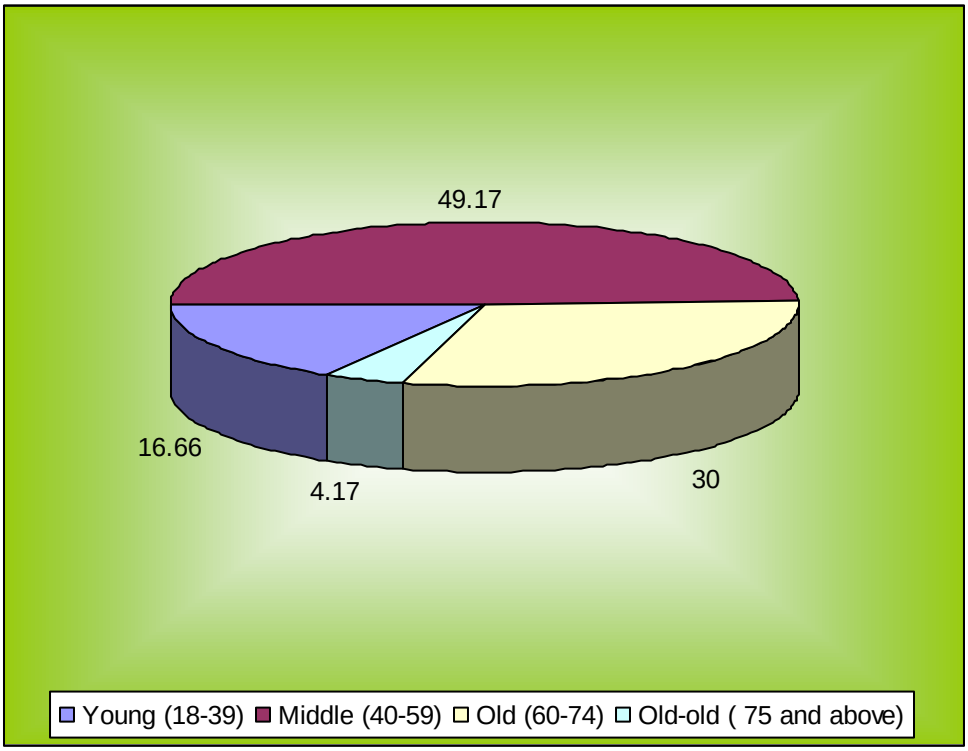
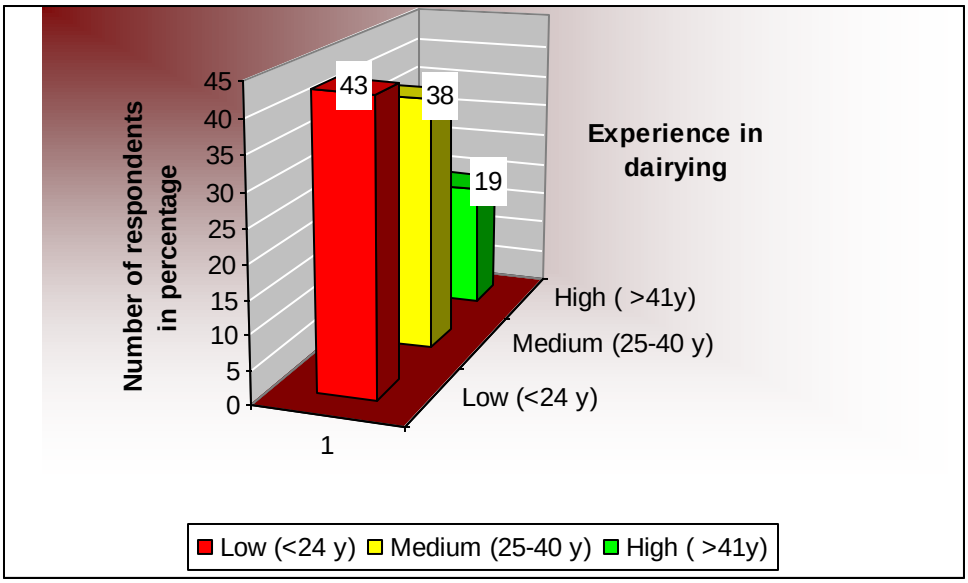


Fig 5. Distribution of dairy farmers based on experience in dairying



Data in table 3 revealed that forty three percent of the dairy farmers had less experience in dairying i.e less than 24 years. Thirty eight percent of the farmers had a medium experience in dairying i.e twenty five to forty years. Nineteen percent of farmers had high experience in dairying which was more than 41 years.

4.1.3 Education

Table 4: Distribution of dairy farmers based on education.

n=120

Sl.No.	Education	f	%
1	Illiterate	3	2.5
2	Primary	28	23.33
3	Schooling	67	55.83
4	Pre-degree/Plus two	14	11.67
5	Degree	6	5
6	Post Graduate	1	0.83

Data in table 4 showed that majority (55.83%) of the dairy farmers got schooling. The other levels of education of dairy farmers were primary school (23.33%), pre-degree/ plus two (11.67%), degree (5%) and post graduate (0.83%). Illiterates were 2.5 percent.

4.1.4 Herd size

Table 5. Distribution of dairy farmers based on herd size.

n=120

Sl.No.	Category	f	%
1	Low (1 animal)	41	34
2	Medium (2-3 animals)	47	39
3	High (4-14 animals)	32	27

Data in table 5 showed that cattle herd size was medium in the case of 39 percent respondents, where as it was low and high in the case of 34 and 27 percent of respondents respectively.

4.1.5. Occupation

4.1.5.1 *Main occupation*

Table 6: Distribution of dairy farmers based on their main occupation

n=120

Sl.No	Category	f	%
1	Petty jobs	20	16.67
2	Agriculture	49	40.83
3	Cattle rearing	38	31.67
4	Business	10	8.33
5	Services	3	2.5

Data in table 6 revealed that the dairy farmers who took agriculture as their main occupation were 40.83 percent followed by cattle rearing (31.67%), petty jobs (16.67%), business (8.33%) and services (2.5%).

4.1.5.2. *Subsidiary occupation*

Table 7. Distribution of dairy farmers based on their subsidiary occupation.

n=120

Sl.No	Category	f	%
1	No subsidiary occupation	37	30.83
2	Petty jobs	5	4.17
3	Agriculture	6	5
4	Cattle rearing	70	58.33
5	Business	2	1.67

Data in table 7 showed that the major subsidiary occupations of dairy farmers were cattle rearing (58.33%) followed by agriculture (5%), petty jobs (4.17%), and business (1.67%). Respondents not having subsidiary occupation were 30.83 percent.

4.1.6. Income from dairying

Table 8: Distribution of dairy farmers based on income from dairying

n= 120

Sl.No	Income (in Rupees)	f	%
1	< 5000	32	26.67
2	5001 - 10000	36	30
3	10001-15000	27	22.5
4	15001-20000	9	7.5
5	20001-25000	6	5
6	Above 25000	10	8.33

Data in table 8 showed that the dairy farmers having an annual income between Rs. 5001/- to Rs. 10000/- were 30 percent followed by 26.67% having an annual income of less than 5000 rupees and 22.5 percent between Rs.10001/- and Rs.15000/-. About 8.33% and 7.5% of the dairy farmers had an annual income of above Rs.25000/- and Rs.15001/- to Rs.20000/- rupees respectively. Five percent of the dairy farmers had an annual income of Rs.20001/- to Rs.25000/-.

The major findings of this section are listed below.

1) About one half of the dairy farmers' were of middle age.

2) Thirty eight percent of the dairy farmers had medium experience in dairying ie. from 25-40 years and 19 percent of the dairy farmers had high experience in dairy farming ie more than 41 years.

3) Majority of the dairy farmers got schooling and a few of them were illiterate.

4) Majority of dairy farmers possessed two or three cattle.

5) Agriculture was the main occupation of 40.83 percent of the dairy farmers.

6) Cattle rearing was the second highest main occupation of the respondents and the highest subsidiary occupation.

7) Thirty percent of the dairy farmers had an annual income ranging between Rs. 5001/- to Rs. 10000/-

Fig 6. Distribution of dairy farmers based on education

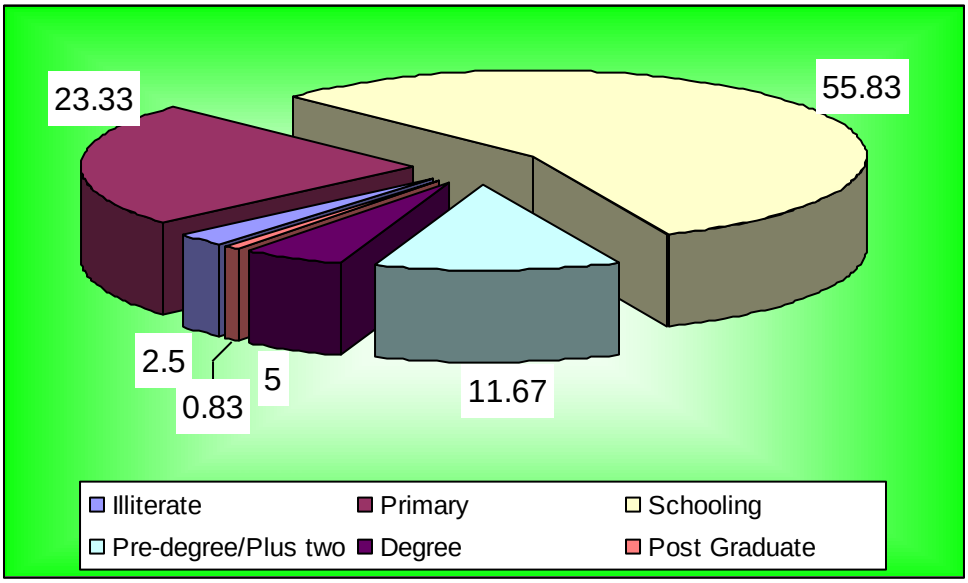


Fig 7. Distribution of dairy farmers based on herd size

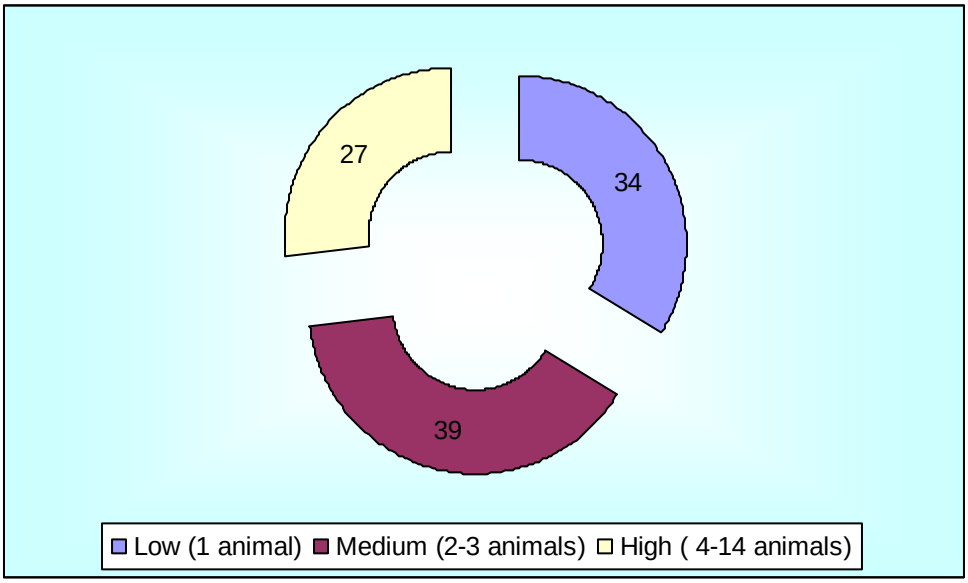


Fig 8. Distribution of dairy farmers based on their main occupation

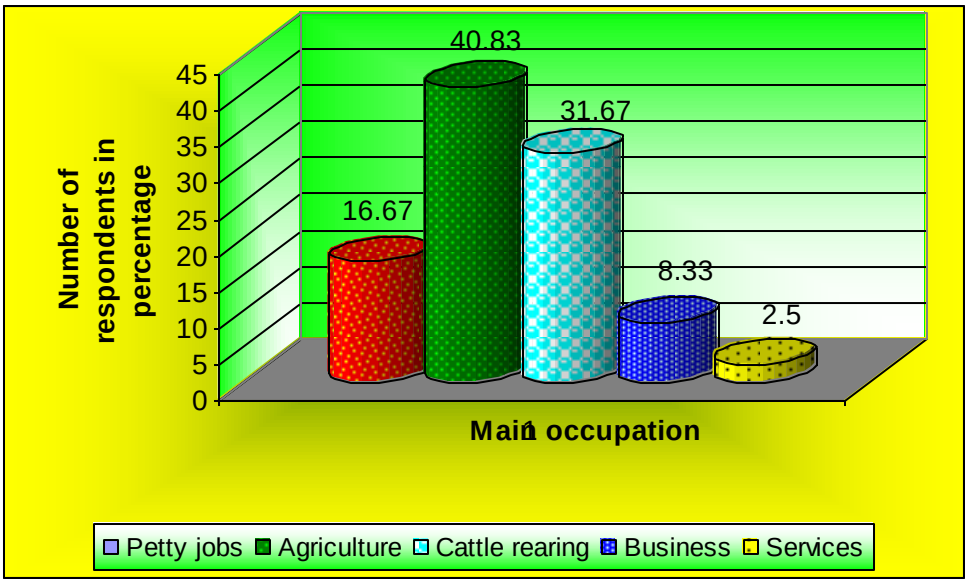


Fig 9. Distribution of dairy farmers based on their subsidiary occupation

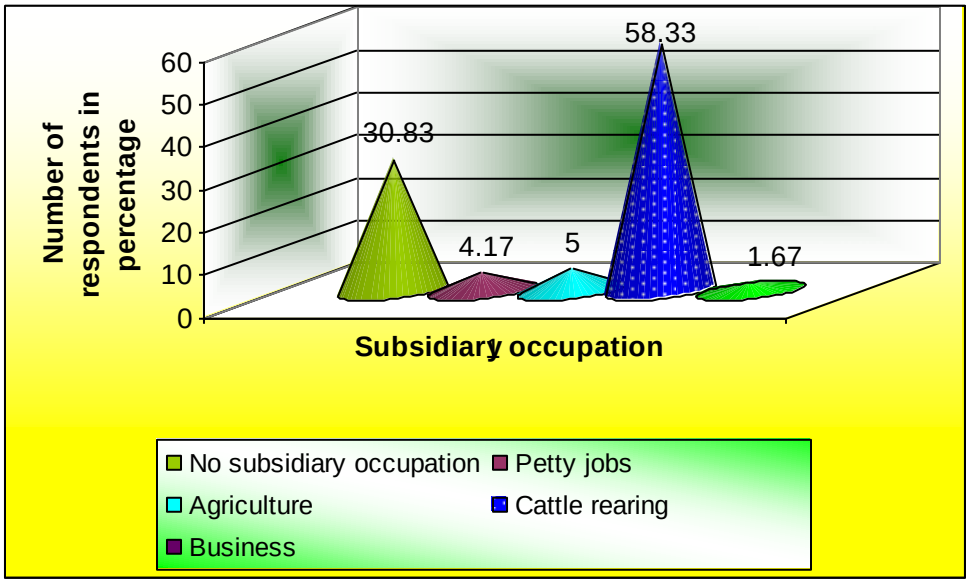
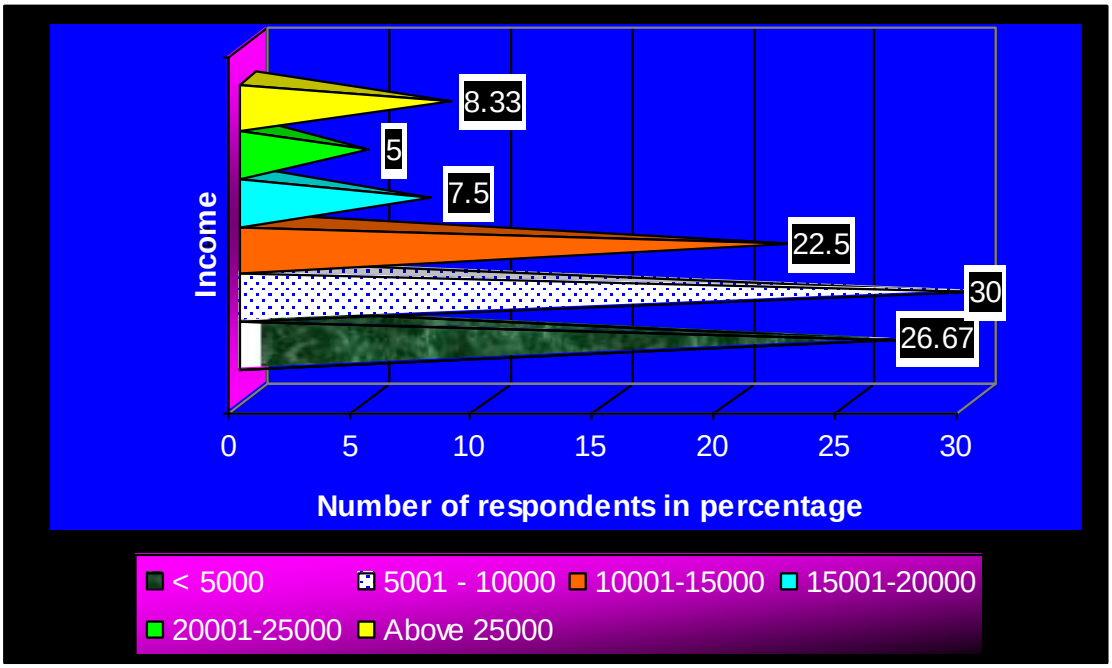


Fig 10. Distribution of dairy farmers based on income from dairying



Communication variables

4.1.7. Media exposure

Table 9: Distribution of farmers based on media exposure

n=120

Sl.No	Media	f	%
1	News Paper	90	75
2	Weekly	14	11.66
3	Monthly	15	12.5
4	New letter	10	8.33
5	Poster	37	30.88
6	Radio	53	44.16
7	Television	81	67.5

Data in table 9 showed that majority of the dairy farmers used newspaper as the information source (75%). The other media from which dairy farmers got information in the descending order were television (67.5%), radio (44.16%), poster (30.83%), monthly (12.5%), weekly (11.66 %) and newsletter (8.33%).

Table 10: Distribution of media based on dairy farmers preference.

n=120

Sl.No.	Preference	Media source
1	Low (120-360)	Weekly, Monthly, Newsletter, Poster, and Radio
2	Medium (361- 600)	Newspaper and Television
3	High (601-840)	Nil

Data in table 10 showed that among the media sources, newspaper and television had medium preference where as weekly, monthly, newsletter, poster and radio had low preference. No media source had high preference.

4.1.8. Interpersonal channels

Table 11: Distribution of dairy farmers based on interpersonal channels as the source of information about FMD.

n=120

Sl.No.	Interpersonal channel	f	%
1	Friends	76	63.33
2	Neighbours	85	70.83
3	Traditional veterinary practitioners	26	21.67
4	Veterinary surgeon	100	83.33
5	Livestock inspector	59	49.16
6	Inseminators	3	2.5
7	Milk society workers	61	50.83
8	WSHG members	7	5.83

Data in table 11 exhibited that majority of the respondents (83.33%) indicated that veterinary surgeon was the source of information about FMD. This was followed by neighbours (70.83%), friends (63.33%), milk society workers (50.83%), livestock inspector (49.16%), traditional veterinary practitioners (21.66%), WSHG members (5.83%) and inseminators (2.5%).

Table 12: Distribution of interpersonal channels based on dairy farmer's preference.

n=120

Sl.No.	Preference	Interpersonal channel source
1	Low (120-400)	Traditional veterinary practitioners, Livestock Inspector, Inseminators, Milk society workers, WSHG members
2	Medium (401- 680)	Friends and neighbours
3	High (681- 960)	Veterinary surgeon

Data in table 12 showed that veterinary surgeon was the highly preferred source of information among interpersonal channels. Medium preference was for friends and neighbours and the lowly preferred sources were traditional veterinary practitioners, livestock inspectors, inseminators, milk society workers and WSHG members.

4.1.9. Seminars/ workshops attended

Table 13. Distribution of dairy farmers based on the seminars / group discussions/ classes attended.

n=120

Sl.No.	Category	f	%
1	Seminar	29	24.17
2	Group discussion	10	8.33
3	Lecture class	47	39.17

Data in table 13 showed that 39.17 percent of the dairy farmers attended lecture classes on FMD. Seminars were attended by 24.17 percent and group discussions by 8.33 percent.

The major findings of this section are listed below.

1) Interpersonal channels were the effective sources of obtaining information about FMD followed by mass media and seminars, group discussions and lecture classes.

2) Majority of the dairy farmers used newspaper as the source of information. Television held the second place.

3) Veterinary surgeon was the most important source of information among interpersonal channels followed by neighbours and friends.

4) Nearly forty percent of the dairy farmers prefer to attend lecture classes than seminars or group discussions.

Fig 11. Distribution of farmers based on media exposure

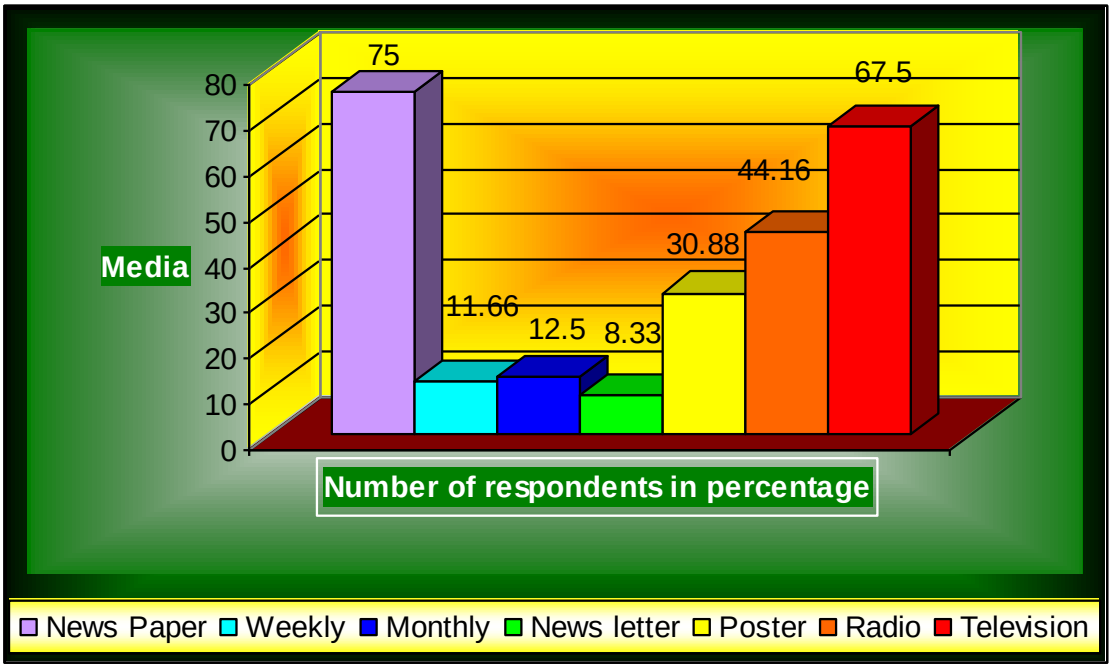


Fig 12. Distribution of dairy farmers based on interpersonal channels as the source of information about FMD

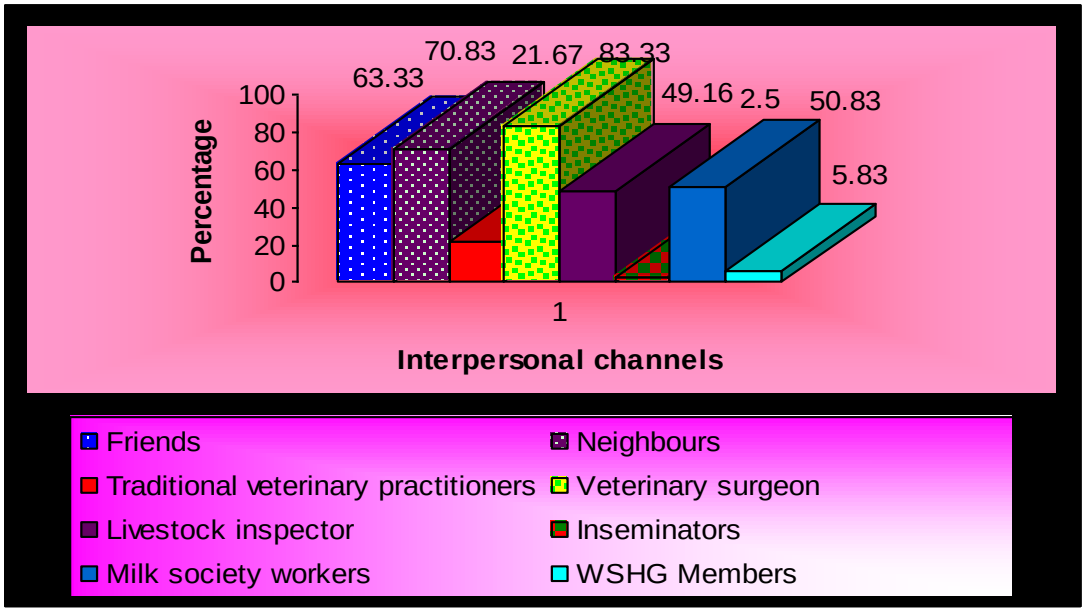
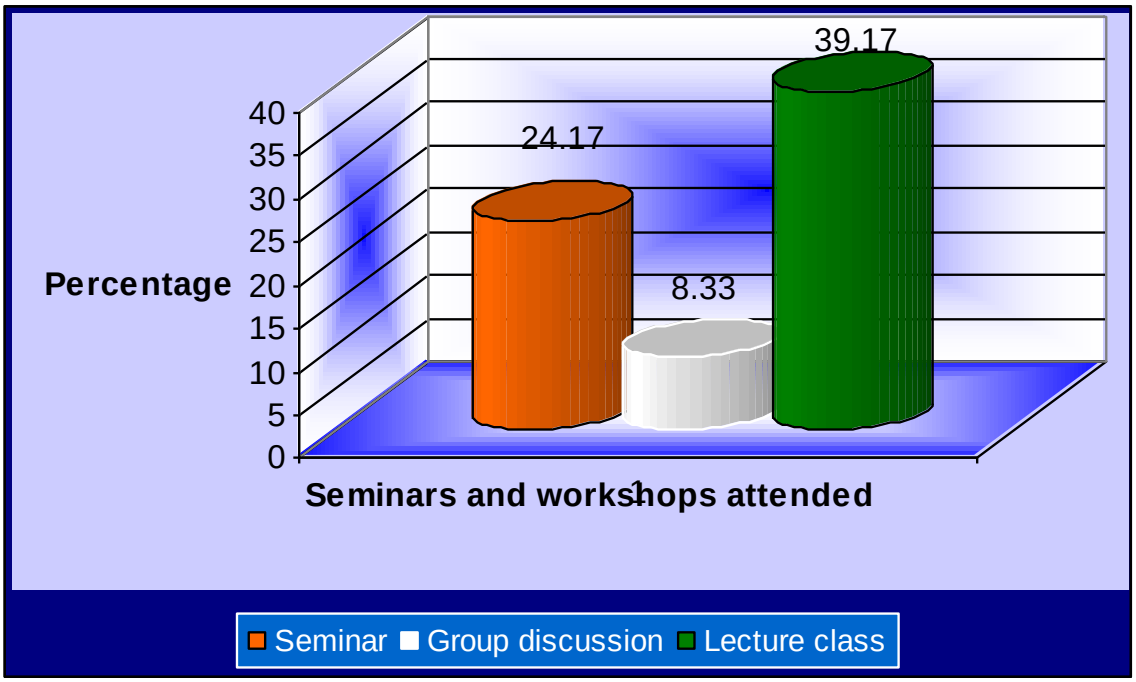


Fig 13. Distribution of dairy farmers based on the seminars / group discussions/ lecture classes attended.



4.2 DEPENDENT VARIABLES

4.2.1. **Attitude towards FMD vaccination**

Table 14. Distribution of FMD experienced and inexperienced dairy farmers based on their attitude towards FMD vaccination.

Sl.No.	Category	FMD Experienced (n=60)			FMD inexperienced (n=60)			Z value
		Score	f	%	Score	f	%	**ns**
1	Unfavourable	13-27	9	15	14-29	11	18	0.071
2	Neutral	28-37	35	58	30-33	16	27	
3	Favourable	38-43	16	27	34-45	33	55	

(** indicated significance at 1% level) (* indicated significance at 5% level) (**ns** means non significant)

Data in table 14 showed that majority of the FMD experienced dairy farmers (58%) had a neutral attitude towards FMD vaccination. This was followed by favourable attitude (27%) and unfavourable attitude (15%).

Majority of FMD inexperienced dairy farmers had favourable attitude towards FMD vaccination (55%). This was followed by neutral (27%) and unfavourable (18%) attitudes.

The Z value (0.071) indicated that there was no significant difference between the attitudes of FMD experienced and inexperienced dairy farmers.

Table 15. Overall distribution of dairy farmers based on their attitude towards FMD vaccination.

n=120

Sl.No.	Category	f	%
1	Unfavourable (13-28)	19	16
2	Neutral (29-36)	64	53
3	Favourable (37-43)	37	31

Data in table 15 showed that majority of the respondents (53%) had neutral attitude towards FMD vaccination. Thirty one percent of the respondents had favourable attitude and 16% had unfavourable attitude towards FMD vaccination.

Major findings of this section are listed below.

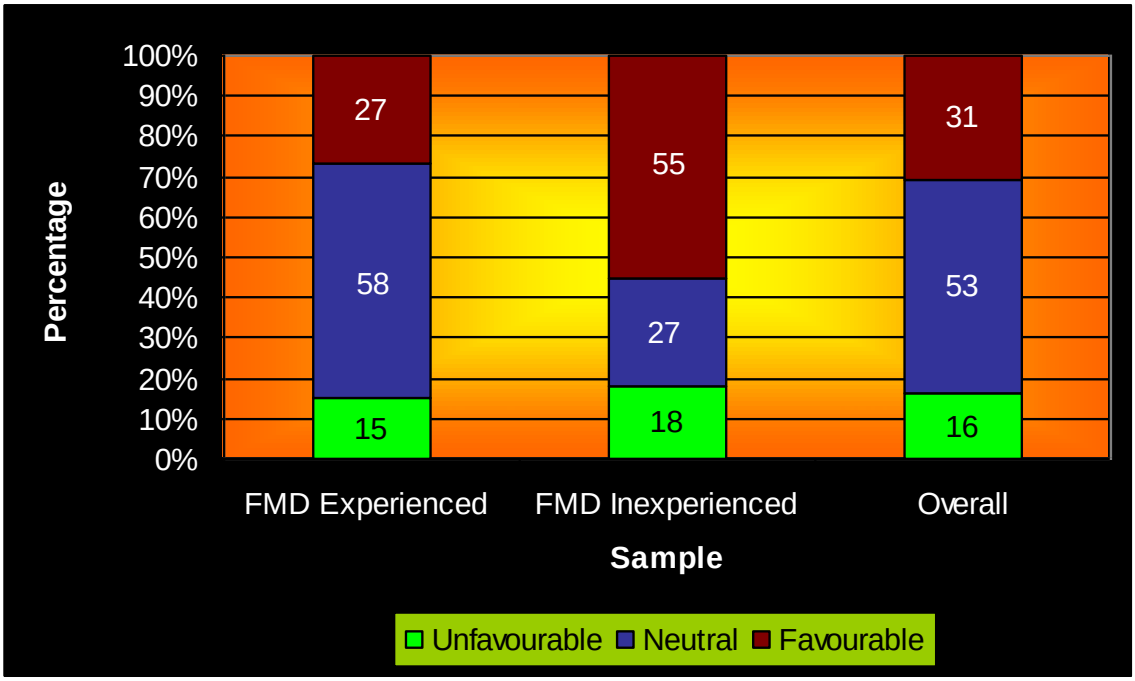
1) Majority of the FMD experienced dairy farmers had a neutral attitude towards FMD vaccination.

2) Majority of the FMD inexperienced dairy farmers had a favourable attitude towards FMD vaccination.

3) In general majority of the dairy farmers had a neutral attitude towards FMD vaccination.

4) There is no significant difference between the attitudes of FMD experienced and inexperienced dairy farmers.

Fig 14. Distribution of dairy farmers based on their attitude towards FMD vaccination



4.2.2. General awareness of FMD.

4.2.2.1. *Awareness of symptoms and transmission.*

Table 16. Distribution of FMD experienced and inexperienced dairy farmers based on their awareness of symptoms and transmission.

Sl.No.	Category	FMD experienced (n=60)			FMD inexperienced (n=60)			Z value
		Score	f	%	Score	f	%	4.62**
1	Low	5-10	21	35	0-8	23	38	
2	Medium	11-12	15	25	9-11	19	32	
3	High	13-15	24	40	12-15	18	30	

Data in table 16 showed that forty percent of the FMD experienced dairy farmers had high awareness about symptoms and transmission of FMD. Thirty five percent of the dairy farmers had low awareness and twenty five percent had medium awareness about symptoms and transmission of FMD.

But thirty eight percent of the FMD inexperienced dairy farmers had low awareness about symptoms and transmission of FMD. Thirty two percent of the dairy farmers had medium awareness and only thirty percent had high awareness about symptoms and transmission of FMD.

The Z value (4.62) indicated that there was highly significant difference in awareness of symptoms and transmission between of FMD experienced and inexperienced dairy farmers.

Table 17. Overall distribution of dairy farmers based on their awareness of symptoms and transmission.

n=120

Sl.No.	Category	f	%
1	Low (0-7)	23	19
2	Medium (8-11)	48	40
3	High (12-15)	49	41

Data in table 17 revealed that forty one percent of the dairy farmers had high awareness about symptoms and transmission of FMD. Forty percent of the dairy farmers had medium awareness and nineteen percent had low awareness about symptoms and transmission of FMD respectively.

4.2.2.1.1. Content analysis of awareness items regarding symptoms and transmission of FMD.

Table 18. Content analysis of the awareness items regarding symptoms and transmission of FMD.

n=120

Sl.No.	Items	f	%	Rank
1	Fever is a symptom of FMD.	113	94.16	1
2	Formation of vesicles in the mouth, inter digital space and udder is a symptom of FMD	101	84.16	6
3	In the case of FMD, fever subsides after the formation of vesicles	41	34.16	15
4	Profuse salivation is a symptom of FMD	111	92.5	2
5	Protrusion of tongue is a symptom of FMD	85	70.83	9
6	Frequent smacking of lips is a sign of FMD	66	55	10
7	In FMD infected animals, shedding of hooves can be noticed	89	74.16	8

Sl.No.	Items	f	%	Rank
8	FMD infected pregnant animals may abort	65	54.16	12
9	Stamping of feet is a symptom of FMD	97	80.83	7
10	Vesicles are first seen on the tongue	66	55	10
11	FMD is a rapidly spreading disease	108	90	3
12	FMD can be transmitted through air	105	87.5	4
13	Visitors to farms may lead to spread of FMD	51	42.5	13
14	Wild ruminants like gaur, sambar deer, deer etc carry infection from one place to another	50	41.66	14
15	Micro organisms are the cause of FMD.	105	87.5	4

Data in table 18 revealed that majority (94.16%) of the dairy farmers were aware that fever is a symptom of FMD and this was ranked first followed by profuse salivation (92.5%), rapidly spreading nature of FMD (90%), FMD can be transmitted through air and microorganisms are the causative organisms of FMD (87.5%), formation of vesicles in the mouth, inter digital space and udder (84.16%), stamping of feet (80.83%), shedding of hooves (74.16%), protrusion of tongue (70.83%), frequent smacking of lips and vesicles are first seen on the tongue (55%), pregnant animals may abort (54.16%), visitors to farm may lead to spread of FMD (42.5%), wild ruminants may lead to spread of FMD (41.66%) and fever subsides after the formation of vesicles (34.16%).

4.2.2.2. Awareness of first aid and disease management.

Table 19 Distribution of FMD experienced and inexperienced dairy farmers based on their awareness of first aid and disease management.

n=60

Sl.No.	Category	FMD Experienced (n=60)			FMD inexperienced (n=60)			Z value
		Score	f	%	Score	f	%	5.0**
1	Low	1-4	23	38	0-2	27	45	
2	Medium	5	8	14	3-4	16	27	
3	High	6-7	29	48	5-7	17	28	

Data of table 19 showed that forty eight percent of the FMD experienced dairy farmers had high awareness of first aid and disease management. Thirty eight percent of the dairy farmers had low awareness and fourteen percent had medium awareness of symptoms and transmission.

Forty five percent of the FMD inexperienced dairy farmers had low awareness of first aid and disease management. Twenty eight percent of the dairy farmers had low awareness and twenty seven percent had medium awareness of first aid and disease management.

The Z value (5.0) indicated that there was a highly significant difference in awareness of first aid and disease management of FMD between experienced and inexperienced dairy farmers.

Table 20. Overall distribution of dairy farmers based on the awareness of first aid and disease management about FMD.

n=120

Sl.No.	Category	f	%
1	Low (0-2)	33	28
2	Medium (3-4)	33	28
3	High (5-7)	54	45

Data in table 20 showed that forty five percent of the dairy farmers had high awareness of first aid and disease management about FMD. Twenty eight percent of the dairy farmers had medium and low level of awareness respectively.

4.2.2.2.1. Content analysis of awareness items regarding awareness of first aid and disease management about FMD.

Table 21. Content analysis of the awareness items regarding awareness about first aid and disease management of FMD.

n=120

Sl.No.	Items	f	%	Rank
1	There is no specific treatment for FMD	39	32.5	7
2	Antibiotics are given for treating secondary bacterial infections	66	55	5
3	Boric acid lotion is used to wash ulcers in mouth	70	58.33	3
4	Boric acid ointment should be applied to heal the ulcers	70	58.33	3
5	Boric acid and honey should be applied in mouth to relieve pain	61	50.83	6
6	Visitors should be prevented from visiting farms in cases of outbreak in the vicinity	75	62.5	2
7	Ring vaccination has to be practiced in a radius of 5 km keeping the point of infection as centre	97	80.83	1

Data from table 21 showed that majority (80.83%) of the dairy farmers knew that ring vaccination has to be practiced in a radius of 5 km keeping the point of infection as centre and ranked as first followed by visitors should be prevented from visiting farms in the event of outbreak in the vicinity (62.5%), boric acid lotion is used to wash ulcers in mouth and boric acid ointment can be applied to heal the ulcers (58.33 %), antibiotics are given for treating secondary bacterial infections (55%), boric acid and honey should be applied in mouth to relieve pain (50.83%) and there is no specific treatment for FMD (32.5%).

4.2.2.3. Awareness of prevention and control.

Table 22. Distribution of FMD experienced and inexperienced dairy farmers based on their awareness of prevention and control of FMD.

Sl.No.	Category	FMD Experienced (n=60)			FMD inexperienced (n=60)			Z value
		Score	f	%	Score	f	%	2.12*
1	Low	1-2	11	18	0-2	6	10	
2	Medium	3	17	28	3-4	35	58	
3	High	4-5	32	54	5-6	19	32	

Data of table 22 showed that majority of the FMD experienced dairy farmers (54%) had high awareness of prevention and control. Twenty eight percent of the dairy farmers had medium awareness. Only eighteen percent of the dairy farmers had low awareness of prevention and control.

Majority of the FMD inexperienced dairy farmers (58%) had medium awareness of prevention and control. Thirty two percent of the dairy farmers had high awareness and ten percent had low awareness about prevention and control.

The Z value (2.12) indicated that there is significant difference in awareness of prevention and control of FMD between experienced and inexperienced dairy farmers.

Table 23. Overall distribution of dairy farmers based on the awareness about prevention and control of FMD.

n=120

Sl.No.	Category	f	%
1	Low (0-2)	29	24
2	Medium (3)	40	33
3	High (4-6)	51	43

Data from table 23 showed that forty three percent of the dairy farmers had high awareness of prevention and control. Thirty three percent of the dairy farmers had medium awareness and twenty four percent had low level of awareness of prevention and control.

4.2.2.3.1. Content analysis of awareness items regarding awareness of prevention and control of FMD.

Table 24. Content analysis of the awareness items regarding awareness of prevention and control of FMD.

n=120

Sl.No.	Items	f	%	Rank
1	The 'Goraksha' project aims to prevent and control FMD in Kerala	82	68.33	3
2	Unvaccinated animals should not be allowed in cattle fairs	95	79.16	1
3	Calves should not be allowed to suckle affected mothers	90	75	2
4	The minimum period after which vaccinated animals should be brought to a village	45	37.5	5
5	The period after which feed and fodder can be bought from an FMD infected village	5	4.16	6
6	The safer period of gestation to vaccinate against FMD	69	57.5	4

Data of table 24 revealed that unvaccinated animals should not be allowed in cattle fairs were known to 79.16% of the dairy farmers and this was ranked first followed by calves should not be allowed to suckle affected mothers (75%), the 'Goraksha' project aims to prevent and control FMD in Kerala (68.33%), the safer period of gestation to vaccinate against FMD (57.5%), the minimum period after which vaccinated animals should be brought to a village (37.5%) and the period after which feed and fodder can be bought from an FMD infected village (4.16%).

4.2.2.4. General awareness of FMD

Table 25. Distribution of FMD experienced and inexperienced dairy farmers based on their general awareness of FMD.

Sl.No.	Category	FMD experienced (n=60)			FMD inexperienced (n=60)			Z value
		Score	f	%	Score	f	%	5.25**
1	Low	8-16	13	22	2-13	22	37	
2	Medium	17-19	15	25	14-16	15	25	
3	High	20-28	32	53	17-25	23	38	

Data of table 25 showed that majority of the FMD experienced dairy farmers (53%) had high awareness of FMD. Twenty five percent had medium awareness and 22% had low awareness of FMD.

Thirty eight percent of the FMD inexperienced dairy farmers had high awareness of FMD. Twenty five percent had medium awareness and 37% had low awareness of FMD.

The Z value (5.25) indicated that there is a highly significant difference in general awareness of FMD between experienced and inexperienced dairy farmers.

4.2.2.5 Overall general awareness of FMD

Table 26. Overall distribution of dairy farmers based on the general awareness of FMD.

n=120

Sl.No.	Category	f	%
1	Low (2-13)	25	21
2	Medium (14-19)	47	39
3	High (20-28)	48	40

Data from table 26 showed that forty percent of the dairy farmers had high awareness of FMD. Thirty nine percent of the dairy farmers had medium awareness and 21 percent had low level of general awareness of FMD.

Major findings of this session are listed below

1) Generally, dairy farmers had either medium or low awareness of symptoms and transmission of FMD

2) There was a statistically significant difference between FMD experienced and inexperienced farmers' awareness of symptoms and transmission

3) Generally, dairy farmers had either medium or low awareness of first aid and disease management of FMD.

4) There was a statistically significant difference between FMD experienced and inexperienced farmers' awareness of first aid and disease management.

5) Majority of the FMD experienced dairy farmers had high awareness of prevention and control.
6) Majority of the FMD inexperienced dairy farmers had medium awareness of prevention and control.

7) Generally, dairy farmers had either medium or low awareness of prevention and control of FMD.

8) Majority of the FMD experienced dairy farmers had high general awareness of FMD.

9) Majority of the FMD inexperienced dairy farmers had either medium or low general awareness of FMD

10) Overall general awareness indicated that majority of the dairy farmers had either medium or low awareness of FMD.

Fig 15. Distribution of dairy farmers based on their awareness of symptoms and transmission

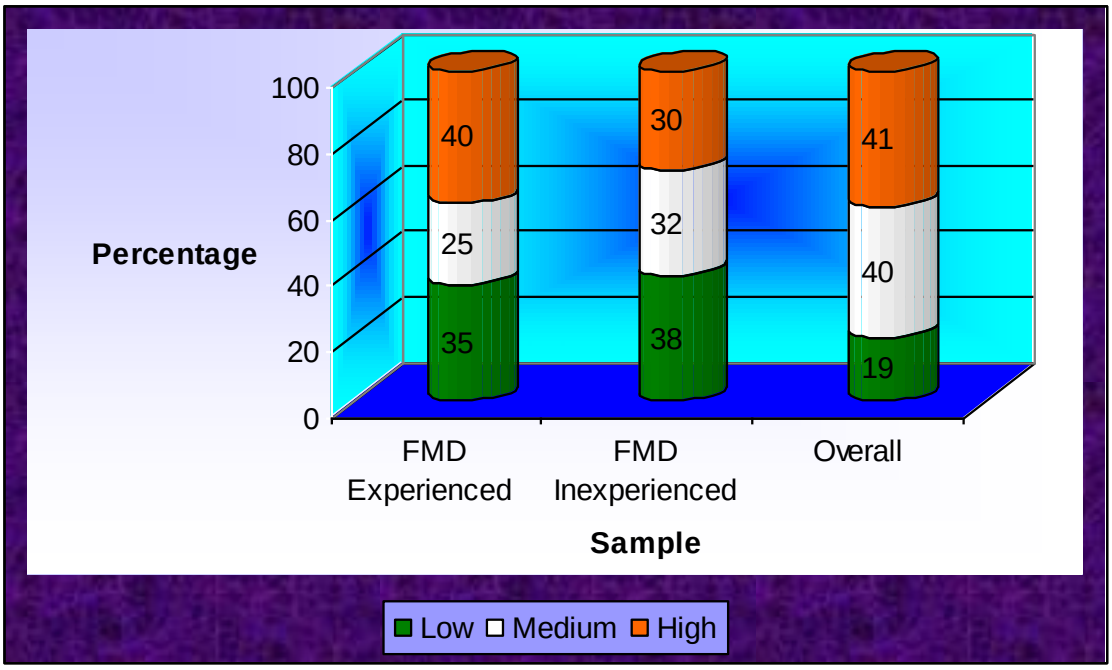


Fig 16. Distribution of dairy farmers based on their awareness of first aid and disease management

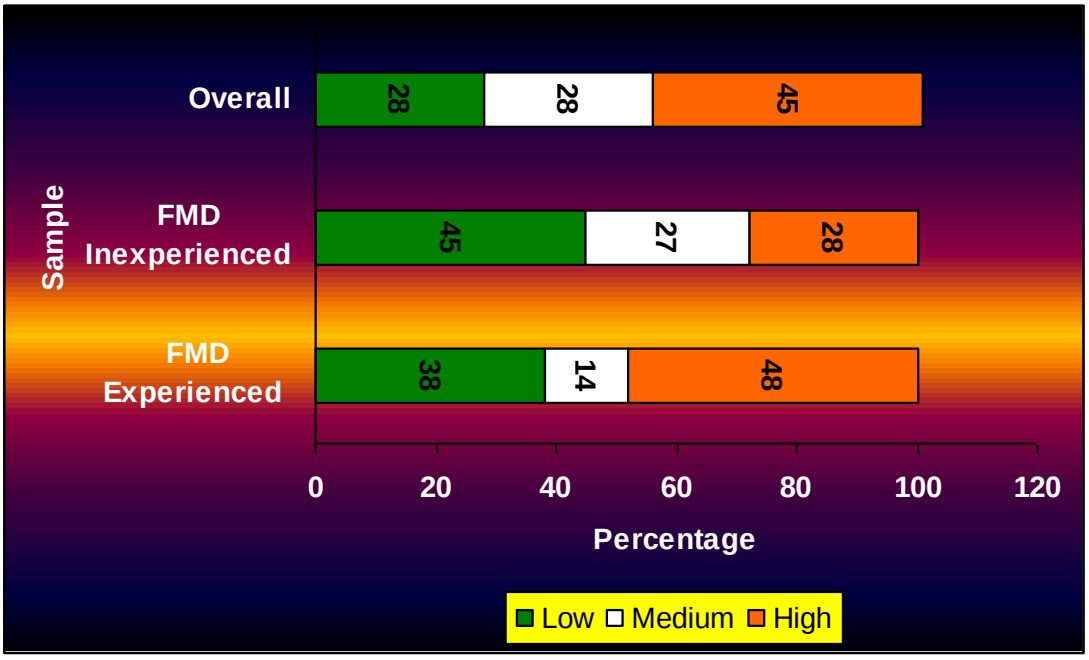


Fig 17. Distribution of dairy farmers based on their awareness of prevention and control

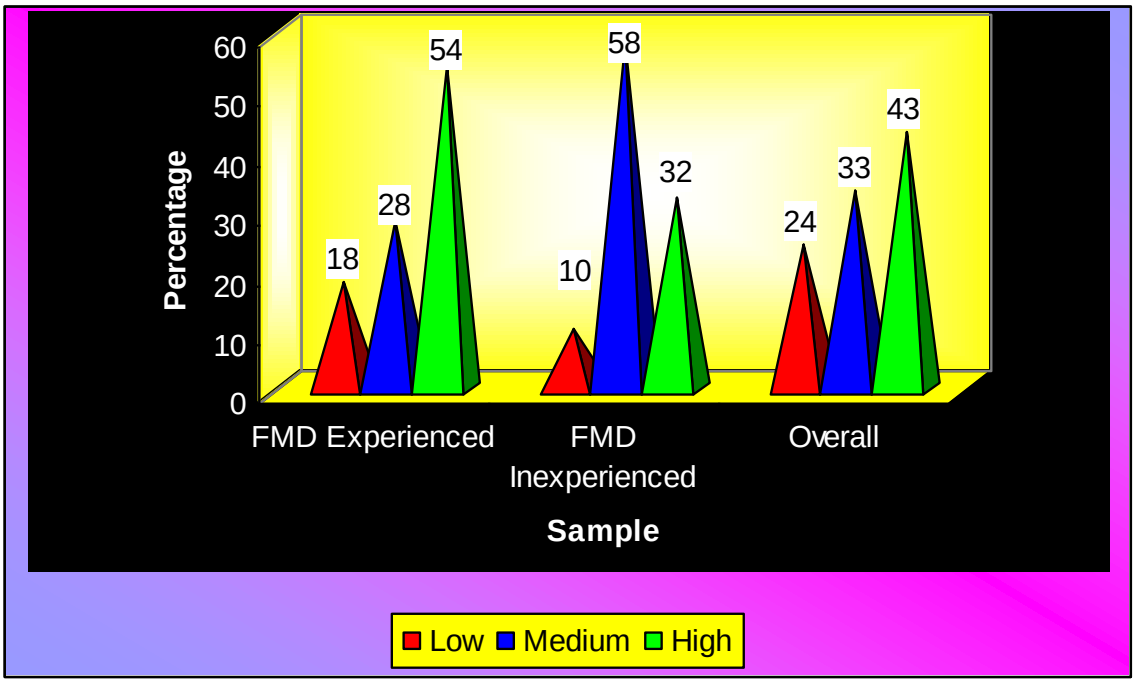
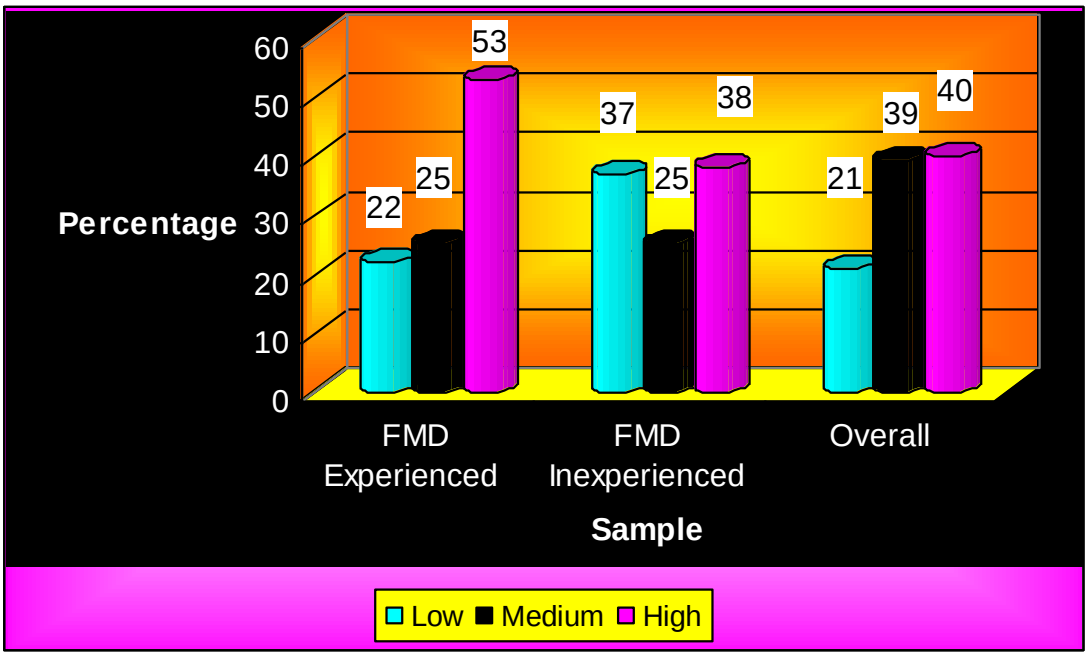


Fig 18. Distribution of dairy farmers based on their general awareness of FMD



4.2.3. Constraints

4.2.3.1. Constraints in adopting control measures.

Table 27. Dairy farmers' constraints in adopting control measures of FMD.

n=120

Sl. No.	Constraints in adopting control measures	FMD Experienced		FMD inexperienced		Overall	
		Score	Rank	Score	Rank	Score	Rank
1	FMD vaccination will result in reduction in milk yield	11	**6**	30	**6**	41	**6**
2	Lack of adequate media publicity on FMD control measures	22	**5**	46	**3**	68	**5**
3	FMD spreads rapidly	90	**2**	79	**2**	129	**3**
4	Since in 'Kole' paddy field regions, wind is more, the control of FMD is difficult.	99	**1**	44	**4**	143	**2**
5	Since livestock are taken to paddy fields for grazing in herds, control is difficult.	40	**4**	35	**5**	75	**4**
6	Won't report FMD due to the fear that if the public knew about the disease, they will not buy milk from them	82	**3**	103	**1**	185	**1**

Data in table 27 showed that the major constraint of FMD experienced dairy farmers was the problem of wind in 'Kole' paddy fields and this was ranked as first followed by rapid spreading of FMD. Farmers won't report FMD due to the fear that if the public knew about the disease, they will not buy milk from them formed the third constraint followed by difficulty in controlling FMD while taking livestock to the paddy fields for grazing in herds, lack of adequate media publicity on FMD control measures and milk reduction due to FMD vaccination, in that order.

The major constraint of FMD inexperienced dairy farmers was that the farmers won't report FMD due to the fear that if the public knew about the disease, they will not buy milk from them and this was ranked as first followed by rapid spreading of FMD, lack of adequate media publicity on FMD control measures, problem of wind in 'Kole'

paddy fields, difficulty in controlling FMD while taking livestock to the paddy fields for grazing in herds and milk reduction due to FMD vaccination, in that order.

In general, the major constraint in adopting FMD control measures was that the farmers won't report FMD due to the fear that if the public knew about the disease, they will not buy milk from them and this was ranked as first followed by the problem of wind in 'Kole' paddy fields, rapid spreading of FMD, difficulty in controlling FMD while taking livestock to the paddy fields for grazing in herds, lack of adequate media publicity on FMD control measures and milk reduction due to FMD vaccination.

4.2.3.2. Constraints in disease management.

Table 28. Dairy farmers' constraints in disease management of FMD.

n=60

Sl.No.	Constraints in disease management	Score	Rank
1	FMD treatment is costly	65	**3**
2	Much time has to be spent for nursing FMD affected animals	110	**1**
3	Lack of space for isolating the affected animals.	16	**7**
4	Reduction in the value of FMD affected animals	14	**8**
5	Controlling and treating affected animals suffering from pain is cumbersome.	87	**2**
6	Unavailability of teak wood oil and wild pig fat as folk medicines.	26	**4**
7	Difficulty to apply ointments to the ulcers in foot	18	**6**
8	Belief that milk of the affected animal should not be used, decreases income	22	**5**

Data of table 28 showed that much time has to be spent for nursing FMD affected animals and this formed the major constraint and was ranked as first followed by difficulty in controlling and treating affected animals suffering from pain, high cost of treatment, unavailability of teak wood oil and wild pig fat as folk medicines, the decrease in income due to the belief that milk of the affected animal should not be used, difficulty to apply ointments to the ulcers in foot, lack of space for isolating the affected animals and reduction in the value of FMD affected animals.

4.2.3.3. Implementing officers constraints while undertaking FMD control measures

Table 29. Implementing officers constraints while undertaking FMD control measure

n=30

Sl.No	Nature of constraint	Constraint
1	Most relevant (>66%)	Unwillingness towards vaccination due to reduction in milk yield (80%), Door step vaccination is laborious (77%), Possible chances of vaccination after effects like abscess, abortion and lameness (70%)
2	Relevant (33-66%)	False or exaggerated media reports developed a negative attitude towards vaccination among dairy farmers (53%), To treat and cure any post vaccination ailments becomes the responsibility of the veterinary surgeon (50%), Farmers have negative attitude towards FMD vaccination (47%), Routine hospital work gets disturbed (47%), Lack of awareness of dairy farmers about FMD vaccination (43%), Difficulty in maintaining cold chain due to unexpected power failure (40%), Farmers don't feel the need of vaccination (40%), Farmers protested as their vaccinated animals also contracted FMD (40%), Uncontrolled animal movements created difficulties in animal disease control (40%), Making the farmers convinced during door step vaccination is difficult and time consuming (40%), Less participation of dairy farmers in seminars or group discussions and lecture classes about FMD (37%), Dairy farmers lack of trust in vaccines (37%), Vaccination stress related health problems are more during summer season (37%), Door step vaccination is difficult during peak summer and rainy season (37%), Old dairy farmers showed more reluctance to vaccinate their cattle (33.34%), Difficulty in changing the attitude of old dairy farmers (33.34%), Lack of publicity about details of FMD vaccination (33.34%), Farmers won't allow ear tagging fearing maggot wound (33.34%).
3	Less relevant (<33%)	Farmers with less experience in dairying, education and herd size showed reluctance (30%), Farmers showed reluctance to bring their cattle to vaccination camps (30%), Lack of support of ward member and local leaders (30%), Control process was laborious due to the lack of a permanent disease management system (30%), Involvement of Kudumbasree units not upto the mark (26%), Fund for publicity and transportation is not sufficient (26%), Farmers believe that there is no need to vaccinate animals reared in isolated homesteads (26%), Farmers won't allow any others except veterinary surgeons to vaccinate (26%), Some farmers showed reluctance to control their livestock during

		vaccination (23%), Farmers lack of trust in mass vaccination programme (23%), It was found difficult to treat other animals after treating FMD contracted animals (23%), Milk society authorities have a negative attitude towards vaccination (20%), Farmers let their cattle for grazing even during outbreak (20%), Risk in maintaining cold chain due to monthly issue of vaccines (20%), Annual vaccination is followed even though the immunity of the vaccine is for 9 months (17%), Farmers won't allow vaccinating male calves (17%), Cost of vaccination was felt high to many (17%), Difficulty in disseminating information about the importance of FMD vaccination to those farmers who had local sale of milk (13%), Farmers lack the knowledge about symptoms of FMD and hence misunderstand with other related diseases (13%), Problems created by the persisting orthodox caste system (10%), Shortage of medicine in government stores (7%), Farmers prefer individual vaccination buying vaccine from private veterinary stores (3%)

* Figures in parenthesis indicate response in percentage.

Data of table 29 showed the most relevant constraints reported by more than 66 percent of the implementing officers. Among them the most felt constraint by majority of the implementing officers while adopting FMD control measures was the dairy farmers' unwillingness towards vaccination due to reduction in milk yield (80%), followed by, door step vaccination is laborious (77%) and possible chances of post vaccination after effects like decreased milk yield, abscess, chance of abortion and lameness (70%).

Constraints found to be relevant were, false or exaggerated media reports developed a negative attitude towards vaccination among dairy farmers (53%), treating and curing any post vaccination ailment becomes the responsibility of the veterinary surgeon (50%), farmers have negative attitude towards FMD vaccination (47%), routine hospital work gets disturbed (47%), lack of awareness of dairy farmers about FMD vaccination (43%), difficulty in maintaining cold chain due to unexpected power failure (40%), dairy farmers don't feel the need of vaccination (40%), farmers

protest as their vaccinated animals also contracted FMD (40%), uncontrolled animal movements created difficulties in animal disease control (40%), making the farmers convinced during door step vaccination is difficult and time consuming (40%), less participation of dairy farmers in seminars or group discussions or lecture classes about FMD (37%), dairy farmers lack of trust in vaccines (37%), vaccination stress related problems are more during summer season (37%), door step vaccination is difficult during peak summer and rainy season (37%), old dairy farmers showed more reluctance to vaccinate their cattle (33.34%), difficulty in changing the attitude of old dairy farmers (33.34%), lack of publicity about details of FMD vaccination (33.34%) and farmers won't allow ear tagging fearing maggot wound (33.34%).

Constraints found to be less relevant were, farmers with less experience in dairying, education and herd size showed reluctance (30%), farmers showed reluctance to bring their cattle to vaccination camps (30%), lack of support of ward members and local leaders (30%), control process was laborious due to the lack of a permanent disease management system (30%), involvement of Kudumbasree units not upto the mark (26%), fund for publicity and transportation is not sufficient (26%), farmers believe that there is no need to vaccinate animals reared in isolated homesteads (26%), farmers won't allow any others except veterinary surgeons to vaccinate (26%), some farmers showed reluctance to control their livestock during vaccination (23%), farmers lack of trust in mass vaccination programme (23%), difficulty to treat other animals after treating FMD contracted animals (23%), milk society authorities have a negative attitude towards vaccination (20%), farmers let their cattle for grazing even during outbreak (20%), risk in maintaining cold chain due to monthly issue of vaccines (20%), annual vaccination is followed even though the immunity of the vaccine is for 9 months (17%), farmers won't allow vaccinating male calves (17%), cost of vaccination was felt high by many (17%), difficulty in disseminating information about the importance of FMD vaccination to those farmers who had local sale of milk (13%), farmers lack the knowledge about symptoms of

FMD and hence misunderstand with other related diseases (13%), problems created by the persisting orthodox caste system (10%), shortage of medicine in government stores (7%) and farmers' prefer individual vaccination buying vaccine from private veterinary stores (3%).

Major findings of this section are listed below

1) The major constraint in controlling FMD to FMD experienced dairy farmers was the problem of wind in 'Kole' paddy fields.

2) The major constraint in controlling FMD to FMD experienced dairy farmers was that the farmers won't report FMD due to the fear that if the public knew about the disease, they won't buy milk from them.

3) In general, the major constraint in adopting FMD control measures was that the farmers won't report FMD due to the fear that if the public knew about the disease, they will not buy milk from them.

4) Much time has to be spent for nursing FMD affected animals was the major constraint in disease management followed by difficulty in controlling and treating affected animals suffering from pain.

5) The most relevant constraints reported by majority of the implementing officers while adopting FMD control measures was the dairy farmers' unwillingness towards vaccination due to reduction in milk yield, followed by, door step vaccination is laborious and possible chances of post vaccination after effects like decreased milk yield, abscess, chance of abortion and lameness.

4.3 RELATIONSHIP BETWEEN INDEPENDENT AND DEPENDENT VARIABLES

4.3.1 Relationship between independent variables and attitude towards FMD vaccination.

4.3.1.1. Multiple regression analysis of independent variables with dependent variable, attitude towards FMD vaccination to FMD experienced dairy farmers

Table 30. Multiple regression analysis of independent variables with dependent variable, attitude towards FMD vaccination to FMD experienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.030	0.0519	0.08	0.649
2	Education	-0.173	-1.109	1.251	0.887
3	Occupation	-0.185	-0.706	0.595	1.187
4	Income from dairying	-0.005	-0.0001	0	1.525
5	Experience in dairying	-0.301	-0.185	0.062	2.98**
6	Herd size	0.043	0.345	0.504	0.684
7	Media exposure	0.301**	1.631	0.677	2.409*
8	Interpersonal channels	0.158	0.226	0.568	0.398
9	Seminar/workshops attended	0.297**	1.75	0.905	1.935

* (P<0.05) ** (P<0.01) F=2.95** Intercept = 36.51 R square = 35.1%

Data in table 30 indicated that out of the nine independent variables studied, two variables viz. media exposure and seminar/workshops attended were significantly correlated with the attitude towards FMD vaccination in FMD experienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the two variables media exposure and experience in dairying were found to be significant in explaining variations in the attitude towards FMD vaccination in FMD experienced dairy farmers. The multiple regression equation fitted to the data was

Y=36.15+ 0.0519x1- 1.109x2- 0.706x3- 0.0001x4- 0.185x5+ 0.345x6+ 1.631x7+ 0.226x8+ 1.75x9.

The coefficient of determination was found to be 31.5%. This indicated that 31.5 percent of total variability in the attitude towards FMD vaccination in FMD experienced dairy farmers could be attributed to the nine independent variables.

4.3.1.2. Multiple regression analysis of independent variables with dependent variable, attitude towards FMD vaccination to FMD inexperienced dairy farmers

Table 31. Multiple regression analysis of independent variables with dependent variable, attitude towards FMD vaccination to FMD inexperienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.189	-0.099	0.085	1.164
2	Education	0.059	0.130	1.001	0.129
3	Occupation	-0.105	-0.329	0.685	0.481
4	Income from dairying	0.122	-0.000037	0	0.583
5	Experience in dairying	-0.124	0.0099	0.062	0.161
6	Herd size	0.276**	0.952	0.473	2.012*
7	Media exposure	0.085	-0.246	0.523	0.469
8	Interpersonal channels	0.217*	0.649	0.428	1.517
9	Seminar/ workshops attended	0.11	0.334	1.131	0.295

* (P<0.05) ** (P<0.01) F=1.24 Intercept = 35.44 R square = 18.3%

Data in table 31 indicated that out of the nine independent variables studied, two variables viz. herd size and interpersonal channels were significantly correlated with the attitude towards FMD vaccination in FMD inexperienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the one variable herd size was found to be significant in explaining variations in the attitude

towards FMD vaccination in FMD inexperienced dairy farmers. The multiple regression equation fitted to the data was

Y=35.44- 0.099x1+ 0.13x2- 0.329x3- 0.000037x4+ 0.0099x5+ 0.952x6- 0.246x7+ 0.649x8+ 0.334x9. The coefficient of determination was found to be 18.3%. This indicated that 18.3 percent of total variability in the attitude towards FMD vaccination in FMD inexperienced dairy farmers could be attributed to the nine independent variables.

4.3.1.3. Multiple regression analysis of independent variables with dependent variable, overall attitude towards FMD vaccination.

Table 32. Multiple regression analysis of independent variables with dependent variable, overall attitude towards FMD vaccination.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.105	-0.016	0.058	0.279
2	Education	-0.047	-0.876	0.769	1.139
3	Occupation	-0.149	-0.503	0.453	1.11
4	Income from dairying	0.069	-0.000064	0	1.206
5	Experience in dairying	-0.213	-0.096	0.044	2.191*
6	Herd size	0.16	0.488	0.341	1.431
7	Media exposure	0.187	0.567	0.409	1.384
8	Interpersonal channels	0.185	0.476	0.336	1.418
9	Seminar/ workshops attended	0.213*	1.107	0.696	1.591

* (P<0.05) ** (P<0.01) F=2.56** Intercept = 36.98 R square = 17.5%

Data in table 32 indicated that out of the nine independent variables studied, one variable viz. seminar/ workshops attended was significantly correlated with the

overall attitude towards FMD vaccination. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the one variable, experience in dairying was found to be significant in explaining variations in the overall attitude towards FMD vaccination. The multiple regression equation fitted to the data was

$Y=36.98- 0.016x1- 0.876x2- 0.503x3- 0.000064x4- 0.096x5+ 0.488x6+ 0.567x7+ 0.476x8+ 1.107x9$. The coefficient of determination was found to be 17.5%. This indicated that 17.5 percent of total variability in the overall attitude towards FMD vaccination could be attributed to the nine independent variables.

4.3.2. Relationship between independent variables and awareness of symptoms and transmission of FMD.

4.3.2.1. Multiple regression analysis of independent variables with dependent variable, awareness of symptoms and transmission to FMD experienced dairy farmers

Table 33. Multiple regression analysis of independent variables with dependent variable, awareness of symptoms and transmission to FMD experienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	0.041	-0.00469	0.032	0.145
2	Education	-0.202	-0.517	0.505	1.02
3	Occupation	-0.112	-0.205	0.24	0.854
4	Income from dairying	0.053	-0.000062	0.0	1.378
5	Experience in dairying	0.022	-0.0119	0.025	0.477
6	Herd size	0.195	0.306	0.204	1.503
7	Media exposure	0.377**	0.596	0.273	2.18*
8	Interpersonal channels	0.271**	0.243	0.230	1.05
9	Seminar/ workshops attended	0.305**	0.57	0.365	1.55

* (P<0.05) ** (P<0.01) F=2.212* Intercept = 11.7 R square = 28.9%

Data in table 33 indicated that out of the nine independent variables studied, three variables viz. media exposure, interpersonal channels and seminar/ workshops attended were significantly correlated with the awareness of symptoms and transmission to FMD experienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple

regression analysis. It could be observed that the one variable, media exposure was found to be significant in explaining variations in the awareness of symptoms and transmission to FMD experienced dairy farmers. The multiple regression equation fitted to the data was Y=11.7- 0.00469x1- 0.517x2- 0.205x3- 0.000062x4- 0.0119x5+ 0.306x6+ 0.596x7+ 0.243x8+ 0.57x9. The coefficient of determination was found to be 28.9%. This indicated that 28.9 percent of total variability in the awareness of symptoms and transmission to FMD experienced dairy farmers, could be attributed to the nine independent variables.

4.3.2.2. Multiple regression analysis of independent variables with dependent variable, awareness of symptoms and transmission to FMD inexperienced dairy farmers

Table 34. Multiple regression analysis of independent variables with dependent variable, awareness of symptoms and transmission to FMD inexperienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.183	-0.0238	0.038	0.626
2	Education	0.243*	0.632	0.448	1.41
3	Occupation	0.018	-0.187	0.306	0.611
4	Income from dairying	0.155	0.000028	0	0.977
5	Experience in dairying	-0.026	0.0234	0.028	0.845
6	Herd size	0.265*	0.478	0.212	2.225*
7	Media exposure	0.497**	0.462	0.234	1.97*
8	Interpersonal channels	0.422**	0.403	0.191	2.1*
9	Seminar/ workshops attended	0.419**	0.98	0.506	1.93

* (P<0.05) ** (P<0.01) F=4.633** Intercept = 4.69 R square = 45.5%

Data in table 34 indicated that out of the nine independent variables studied, five variables viz. education, herd size, media exposure, interpersonal channels and seminar/ workshops attended were significantly correlated with the awareness of symptoms and transmission to FMD inexperienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the three variables, herd size, media exposure and interpersonal channels were found to be significant in explaining variations in the awareness of symptoms and transmission to FMD inexperienced dairy farmers. The multiple regression equation fitted to the data was

$Y=4.69- 0.0238x1+ 0.632x2- 0.187x3+ 0.000028x4+ 0.0234x5+ 0.478x6+ 0.462x7+ 0.403x8+ 0.98x9$. The coefficient of determination was found to be 45.5%. This indicated that 45.5 percent of total variability in the awareness of symptoms and transmission to FMD inexperienced dairy farmers, could be attributed to the nine independent variables.

4.3.2.3. Multiple regression analysis of independent variables with dependent variable, overall awareness of symptoms and transmission.

Table 35. Multiple regression analysis of independent variables with dependent variable, overall awareness of symptoms and transmission of FMD.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.109	-0.0241	0.026	0.916
2	Education	0.041	0.0361	0.35	0.103
3	Occupation	-0.018	-0.147	0.206	0.712
4	Income from dairying	0.077	-0.000048	0	1.99*
5	Experience in dairying	0.007	0.00613	0.02	0.307
6	Herd size	0.214*	0.402	0.155	2.59**
7	Media exposure	0.394**	0.508	0.186	2.73**
8	Interpersonal channels	0.357**	0.37	0.153	2.423*
9	Seminar/ workshops attended	0.381**	0.986	0.316	3.12**

* (P<0.05) ** (P<0.01) F=5.88** Intercept = 8.5 R square = 32.7%

Data in table 35 indicated that out of the nine independent variables studied, four variables viz. herd size, media exposure, interpersonal channels and seminar/ workshops attended were significantly correlated with the overall awareness of symptoms and transmission of FMD. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the five variables, income from dairying, herd size, media exposure, interpersonal channels and seminar/ workshops attended were found to be significant in explaining variations in the overall awareness of symptoms and transmission of FMD. The multiple regression equation fitted to the data was

Y=8.5-

0.0241x1+ 0.0361x2- 0.147x3- 0.000048x4+ 0.00613x5+ 0.402x6+ 0.508x7+ 0.37x8+ 0.986x9. The coefficient of determination was found to be 32.7%. This indicated that 32.7 percent of total variability in the overall awareness of symptoms and transmission of FMD, could be attributed to the nine independent variables.

4.3.3. Relationship between independent variables and awareness of first aid and disease management of FMD.

4.3.3.1. Multiple regression analysis of independent variables with dependent variable, awareness of first aid and disease management to FMD experienced dairy farmers

Table 36. Multiple regression analysis of independent variables with dependent variable, awareness of first aid and disease management to FMD experienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.085	-0.0152	0.019	0.796
2	Education	-0.017	-0.231	0.3	0.77
3	Occupation	0.196	0.206	0.143	1.44
4	Income from dairying	0.25*	0.0000075	0	0.279
5	Experience in dairying	-0.004	-0.00303	0.015	0.203
6	Herd size	0.128	0.0826	0.121	0.683
7	Media exposure	0.428**	0.263	0.162	1.62
8	Interpersonal channels	0.51**	0.379	0.136	2.78**
9	Seminar/ workshops attended	0.138	0.429	0.217	0.198

* (P<0.05) ** (P<0.01) F=3.129** Intercept = 3.11 R square = 36.5%

Data in table 36 indicated that out of the nine independent variables studied, three variables viz. income from dairying, media exposure and interpersonal channels were significantly correlated with the awareness of first aid and disease management to FMD experienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the variable, interpersonal channel was found to be significant in explaining variations in the awareness of first aid and disease management to FMD experienced dairy farmers. The multiple regression equation fitted to the data was

Y=3.11- 0.0152x1- 0.231x2+ 0.206x3+ 0.0000075x4- 0.00303x5+ 0.0826x6+ 0.263x7+ 0.379x8+ 0.429x9.

The coefficient of determination was found to be 36.5%. This indicated that 36.5 percent of total variability in the awareness of first aid and disease management to FMD experienced dairy farmers, could be attributed to the nine independent variables.

4.3.3.2. Multiple regression analysis of independent variables with dependent variable, awareness of first aid and disease management to FMD inexperienced dairy farmers.

Table 37. Multiple regression analysis of independent variables with dependent variable, awareness of first aid and disease management to FMD inexperienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.09	0.014	0.024	0.613
2	Education	0.264*	0.552	0.286	1.92
3	Occupation	0.081	0.0155	0.196	0.079
4	Income from dairying	0.25*	0.0000007	0	0.041
5	Experience in dairying	-0.032	0.00366	0.018	0.206
6	Herd size	0.225*	0.161	0.135	1.192
7	Media exposure	0.488**	0.29	0.15	1.935
8	Interpersonal channels	0.246*	0.053	0.122	0.436
9	Seminar/ workshops attended	0.486**	0.839	0.324	2.59*

* (P<0.05) ** (P<0.01) F=3.78** Intercept = -1.373 R square = 40.5%

Data in table 37 indicated that out of the nine independent variables studied, six variables viz. education, income from dairying, herd size, media exposure, interpersonal channels and seminars/ workshops attended were significantly correlated with the awareness of first aid and disease management to FMD inexperienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the one variable, seminar/ workshops attended was found to be significant in

explaining variations in the awareness of first aid and disease management to FMD inexperienced dairy farmers. The multiple regression equation fitted to the data was

Y=-1.373+ 0.014x1+ 0.552x2+ 0.0155x3+ 0.0000007x4+ 0.00366x5+ 0.161x6+ 0.29x7+ 0.053x8+ 0.839x9.

The coefficient of determination was found to be 40.5%. This indicated that 40.5 percent of total variability in the awareness of first aid and disease management to FMD inexperienced dairy farmers, could be attributed to the nine independent variables.

4.3.3.3. Multiple regression analysis of independent variables with dependent variable, overall awareness of first aid and disease management of FMD.

Table 38. Multiple regression analysis of independent variables with dependent variable, overall awareness of first aid and disease management of FMD.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.1	-0.0037	0.017	0.22
2	Education	0.113	0.104	0.225	0.462
3	Occupation	0.139	0.141	0.132	1.06
4	Income from dairying	0.186	0.0000015	0	0.1
5	Experience in dairying	0.011	0.00165	0.013	0.129
6	Herd size	0.173	0.137	0.1	1.37
7	Media exposure	0.418**	0.298	0.12	2.49*
8	Interpersonal channels	0.343**	0.211	0.098	2.15*
9	Seminar/ workshops attended	0.347**	0.491	0.203	2.41*

* (P<0.05) ** (P<0.01) F=4.85** Intercept = 0.971 R square = 28.6%

Data in table 38 indicated that out of the nine independent variables studied, three variables viz. media exposure, interpersonal channels and seminar/ workshops attended were significantly correlated with the overall awareness of first aid and disease management. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that the three variables, media exposure, interpersonal channel and seminar/ workshops attended were found to be significant in explaining variations in the overall awareness of first aid and disease management of FMD. The multiple regression equation fitted to the data was Y=0.971- 0.0037x1+ 0.014x2+ 0.141x3+ 0.0000015x4+ 0.00165x5+ 0.137x6+ 0.298x7+ 0.211x8+ 0.491x9. The coefficient of determination was found to be 28.6%. This indicated that 28.6 percent of total variability in the overall awareness of first aid and disease management of FMD, could be attributed to the nine independent variables.

4.3.4. Relationship between independent variables and awareness of prevention and control of FMD.

4.3.4.1. Multiple regression analysis of independent variables with dependent variable, awareness of prevention and control to FMD experienced dairy farmers

Table 39. Multiple regression analysis of independent variables with dependent variable, awareness of prevention and control to FMD experienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	0.066	0.019	0.014	1.35
2	Education	-0.008	0.169	0.22	0.772
3	Occupation	-0.026	-0.012	0.104	0.116
4	Income from dairying	0.041	-0.000032	0	1.64
5	Experience in dairying	-0.106	-0.0177	0.011	1.62
6	Herd size	0.172	0.175	0.088	1.97
7	Media exposure	0.249*	0.252	0.119	2.12*
8	Interpersonal channels	0.15	0.025	0.1	0.252
9	Seminar/ workshops attended	0.079	0.026	0.159	0.165

* (P<0.05) ** (P<0.01) F=1.24 Intercept = 1.63 R square = 18.5%

Data in table 39 indicated that out of the nine independent variables studied, one variable viz. media exposure was significantly correlated with the awareness of prevention and control to FMD experienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to

multiple regression analysis. It could be observed that the variable, media exposure was found to be significant in explaining variations in the awareness of prevention and control to FMD experienced dairy farmers. The multiple regression equation fitted to the data was Y=1.63+ 0.019x1+ 0.169x2- 0.012x3- 0.000032x4- 0.0177x5+ 0.175x6+ 0.252x7+ 0.025x8+ 0.026x9. The coefficient of determination was found to be 18.5%. This indicated that 18.5 percent of total variability in the awareness of prevention and control to FMD experienced dairy farmers, could be attributed to the nine independent variables.

4.3.4.2. Multiple regression analysis of independent variables with dependent variable, awareness of prevention and control to FMD inexperienced dairy farmers

Table 40. Multiple regression analysis of independent variables with dependent variable, awareness of prevention and control to FMD inexperienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.143	-0.0032	0.019	0.171
2	Education	0.079	0.0193	0.223	0.087
3	Occupation	-0.219	-0.194	0.152	1.27
4	Income from dairying	0.032	-0.000016	0	1.112
5	Experience in dairying	-0.247	-0.0169	0.014	1.22
6	Herd size	0.215*	0.154	0.105	1.461
7	Media exposure	0.188	0.136	0.116	1.168
8	Interpersonal channels	0.167	0.099	0.095	1.041
9	Seminar/ workshops attended	0.042	-0.0705	0.252	0.28

* (P<0.05) ** (P<0.01) F=1.44 Intercept = 3.53 R square = 20.6%

Data in table 40 indicated that out of the nine independent variables studied, the variable viz. herd size was significantly correlated with the awareness of prevention and control to FMD inexperienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that no variable was significant in explaining variations in the awareness of prevention and control to FMD inexperienced dairy farmers. The multiple regression equation fitted to the data was Y=3.53- 0.0032x1+ 0.0193x2- 0.194x3- 0.000016x4- 0.0169x5+ 0.154x6+ 0.136x7+ 0.099x8- 0.0705x9.The coefficient of determination was found to be 20.6%. This indicated that 20.6 percent of total variability in the awareness of prevention and control to FMD inexperienced dairy farmers, could be attributed to the nine independent variables.

4.3.4.3. Multiple regression analysis of independent variables with dependent variable, overall awareness of prevention and control of FMD.

Table 41. Multiple regression analysis of independent variables with dependent variable, overall awareness of prevention and control of FMD.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.057	0.0058	0.011	0.518
2	Education	0.033	0.022	0.15	0.151
3	Occupation	-0.12	-0.071	0.088	0.811
4	Income from dairying	0.017	-0.000022	0	2.21*
5	Experience in dairying	-0.169	-0.0172	0.009	2.01*
6	Herd size	0.198*	0.175	0.066	2.64**
7	Media exposure	0.209*	0.155	0.079	1.95*
8	Interpersonal channels	0.167	0.077	0.065	1.18
9	Seminar/ workshops attended	0.089	0.0318	0.135	0.235

* (P<0.05) ** (P<0.01) F=2.35** Intercept = 2.72 R square = 16.3%

Data in table 41 indicated that out of the nine independent variables studied, two variables viz. herd size and media exposure were significantly correlated with the overall awareness of prevention and control of FMD. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that four variables viz. income from dairying, experience in dairying, herd size and media exposure were found to be significant in explaining variations in the overall awareness of prevention and control of FMD. The multiple regression equation fitted to the data was

Y=2.72+ 0.0058x1+ 0.022x2- 0.071x3- 0.000022x4- 0.0172x5+ 0.175x6+ 0.155x7+ 0.077x8+ 0.0318x9.

The coefficient of determination was found to be 16.3%. This indicated that 16.3

percent of total variability in the overall awareness of prevention and control of FMD, could be attributed to the nine independent variables.

4.3.5. Relationship between independent variables and general awareness of FMD.

4.3.5.1. Multiple regression analysis of independent variables with dependent variable, general awareness of FMD to FMD experienced dairy farmers

Table 42. Multiple regression analysis of independent variables with dependent variable, general awareness of FMD to FMD experienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	0.009	-0.00094	0.05	0.019
2	Education	-0.133	-0.579	0.781	0.742
3	Occupation	0.001	-0.0118	0.371	0.032
4	Income from dairying	0.141	-0.000087	0	1.24
5	Experience in dairying	-0.015	-0.032	0.039	0.844
6	Herd size	0.215*	0.563	0.315	1.79
7	Media exposure	0.474**	1.112	0.423	2.63**
8	Interpersonal channels	0.404**	0.647	0.355	1.82
9	Seminar/ workshops attended	0.265*	0.639	0.565	1.13

* (P<0.05) ** (P<0.01) F=2.991** Intercept = 16.46 R square = 35.5%

Data in table 42 indicated that out of the nine independent variables studied, four variables viz. herd size, media exposure, interpersonal channel and seminar/ workshops attended were significantly correlated with the general awareness of FMD

to FMD experienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that only one variable, media exposure was significant in explaining variations in the general awareness of FMD to FMD experienced dairy farmers. The multiple regression equation fitted to the data was Y=16.46- 0.00094x1- 0.579x2- 0.0118x3- 0.000087x4- 0.032x5+ 0.563x6+ 1.112x7+ 0.647x8+ 0.639x9. The coefficient of determination was found to be 35.5%. This indicated that 35.5 percent of total variability in the general awareness of FMD to FMD experienced dairy farmers, could be attributed to the nine independent variables.

4.3.5.2. Multiple regression analysis of independent variables with dependent variable, general awareness of FMD to FMD inexperienced dairy farmers

Table 43. Multiple regression analysis of independent variables with dependent variable, general awareness of FMD to FMD inexperienced dairy farmers.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.18	-0.012	0.061	0.199
2	Education	0.265*	1.2	0.717	1.67
3	Occupation	-0.014	-0.366	0.49	0.746
4	Income from dairying	0.195	-0.000043	0	0.94
5	Experience in dairying	-0.089	0.010	0.045	0.229
6	Herd size	0.298**	0.793	0.339	2.34*
7	Media exposure	0.529**	0.887	0.375	2.369*
8	Interpersonal channels	0.389**	0.555	0.306	1.81
9	Seminar/ workshops attended	0.445**	1.749	0.81	2.16*

* (P<0.05) ** (P<0.01) F=5.261** Intercept = 6.85 R square = 48.6%

Data in table 43 indicated that out of the nine independent variables studied, five variables viz. education, herd size, media exposure, interpersonal channel and seminars/ workshops attended were significantly correlated with the general awareness of FMD to FMD inexperienced dairy farmers. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that three variables, herd size, media exposure and seminars/ workshops attended were found to be significant in explaining variations in the general awareness of FMD to FMD inexperienced dairy farmers. The multiple regression equation fitted to the data was

$Y=6.85- 0.012x1+ 1.2x2- 0.366x3- 0.000043x4+ 0.01x5+ 0.793x6+ 0.887x7+ 0.555x8+ 0.749x9.$

The coefficient of determination was found to be 48.6%. This indicated that 48.6 percent of total variability in the general awareness of FMD to FMD inexperienced dairy farmers, could be attributed to the nine independent variables.

4.3.5.3. Multiple regression analysis of independent variables with dependent variable, overall general awareness of FMD.

Table 44. Multiple regression analysis of independent variables with dependent variable, overall general awareness of FMD.

Sl. No.	Independent variable	Correlation coefficient	Regression coefficient	Standard error	t- value
1	Age	-0.116	-0.022	0043	0.512
2	Education	0.075	0.0903	0.571	0.158
3	Occupation	0.013	-0.076	0.336	0.228
4	Income from dairying	0.12	-0.000069	0	1.75
5	Experience in dairying	-0.031	-0.0094	0.03	0.289
6	Herd size	0.238*	0.715	0.253	2.82**
7	Media exposure	0.44**	0.962	0.30	3.16**
8	Interpersonal channels	0.38**	0.658	0.24	2.64**
9	Seminar/ workshops attended	0.378**	1.5	0.517	2.91**

* (P<0.05) ** (P<0.01) F=6.7 Intercept = 12.2 R square = 35.6%

Data in table 44 indicated that out of the nine independent variables studied, four variables viz. herd size, media exposure, interpersonal channel and seminars/ workshops attended were significantly correlated with the overall general awareness of FMD. In order to assess the relative contribution of each of the independent variables, the data was subjected to multiple regression analysis. It could be observed that four variables, herd size, media exposure, interpersonal channels and seminars/ workshops attended were found to be significant in explaining variations in the overall general awareness of FMD. The multiple regression equation fitted to the data was

Y=12.2- 0.022x1+ 0.0903x2- 0.076x3- 0.000069x4- 0.0094x5+ 0.715x6+ 0.962x7+ 0.658x8+ 1.5x9.

The coefficient of determination was found to be 35.6%. This indicated that 35.6 percent of total variability in the overall general awareness of FMD could be attributed to the nine independent variables.

Major findings of this section are listed below:

1. Media exposure and seminar/ workshops attended were significantly correlated with the attitude towards FMD vaccination in FMD experienced dairy farmers.

2. Media exposure and experience in dairying were found to be significant in explaining variations in the attitude towards FMD vaccination in FMD experienced dairy farmers.

3. Herd size and interpersonal channels were significantly correlated with the attitude towards FMD vaccination in FMD inexperienced dairy farmers.

4. Herd size was found to be significant in explaining variations in the attitude towards FMD vaccination in FMD inexperienced dairy farmers.

5. Seminars/ workshops attended were significantly correlated with the overall attitude towards FMD vaccination.

6. Experience in dairying was found to be significant in explaining variations in the overall attitude towards FMD vaccination.

7. Media exposure, interpersonal channels and seminars/ workshops attended were significantly correlated with the awareness of symptoms and transmission to FMD experienced dairy farmers.

8. Media exposure was found to be significant in explaining variations in the awareness of symptoms and transmission to FMD experienced dairy farmers.

9. Education, herd size, media exposure, interpersonal channels and seminars/ workshops attended were significantly correlated with the awareness of symptoms and transmission to FMD inexperienced dairy farmers.

10. Herd size, media exposure and interpersonal channels were found to be significant in explaining variations in the awareness of symptoms and transmission to FMD inexperienced dairy farmers.

11. Herd size, media exposure, interpersonal channels and seminars/ workshops attended were significantly correlated with the overall awareness of symptoms and transmission of FMD.

12. Income from dairying, herd size, media exposure, interpersonal channels and seminars/ workshops attended were found to be significant in explaining variations in the overall awareness of symptoms and transmission of FMD.

13. Income from dairying, media exposure and interpersonal channels were significantly correlated with the awareness of first aid and disease management to FMD experienced dairy farmers.

14. Interpersonal channel was found to be significant in explaining variations in the awareness of first aid and disease management to FMD experienced dairy farmers.

15. Education, income from dairying, herd size, media exposure, interpersonal channels and seminars/ workshops attended were significantly correlated with the awareness of first aid and disease management to FMD inexperienced dairy farmers.

16. Seminars/ workshops attended was found to be significant in explaining variations in the awareness of first aid and disease management to FMD inexperienced dairy farmers.

17. Media exposure, interpersonal channels and seminars/ workshops attended were significantly correlated with the overall awareness of first aid and disease management.

18. Media exposure, interpersonal channel and seminars/ workshops attended were found to be significant in explaining variations in the overall awareness of first aid and disease management of FMD.

19. Media exposure was significantly correlated with the awareness of prevention and control to FMD experienced dairy farmers.

20. Media exposure was found to be significant in explaining variations in the awareness of prevention and control to FMD experienced dairy farmers.

21. Herd size was significantly correlated with the awareness of prevention and control to FMD inexperienced dairy farmers.

22. Herd size and media exposure were significantly correlated with the overall awareness of prevention and control of FMD.

23. Income from dairying, experience in dairying, herd size and media exposure were found to be significant in explaining variations in the overall awareness of prevention and control of FMD.

24. Herd size, media exposure, interpersonal channel and seminars/ workshops attended were significantly correlated with the general awareness of FMD to FMD experienced dairy farmers.

25. Media exposure was significant in explaining variations in the general awareness of FMD to FMD experienced dairy farmers.

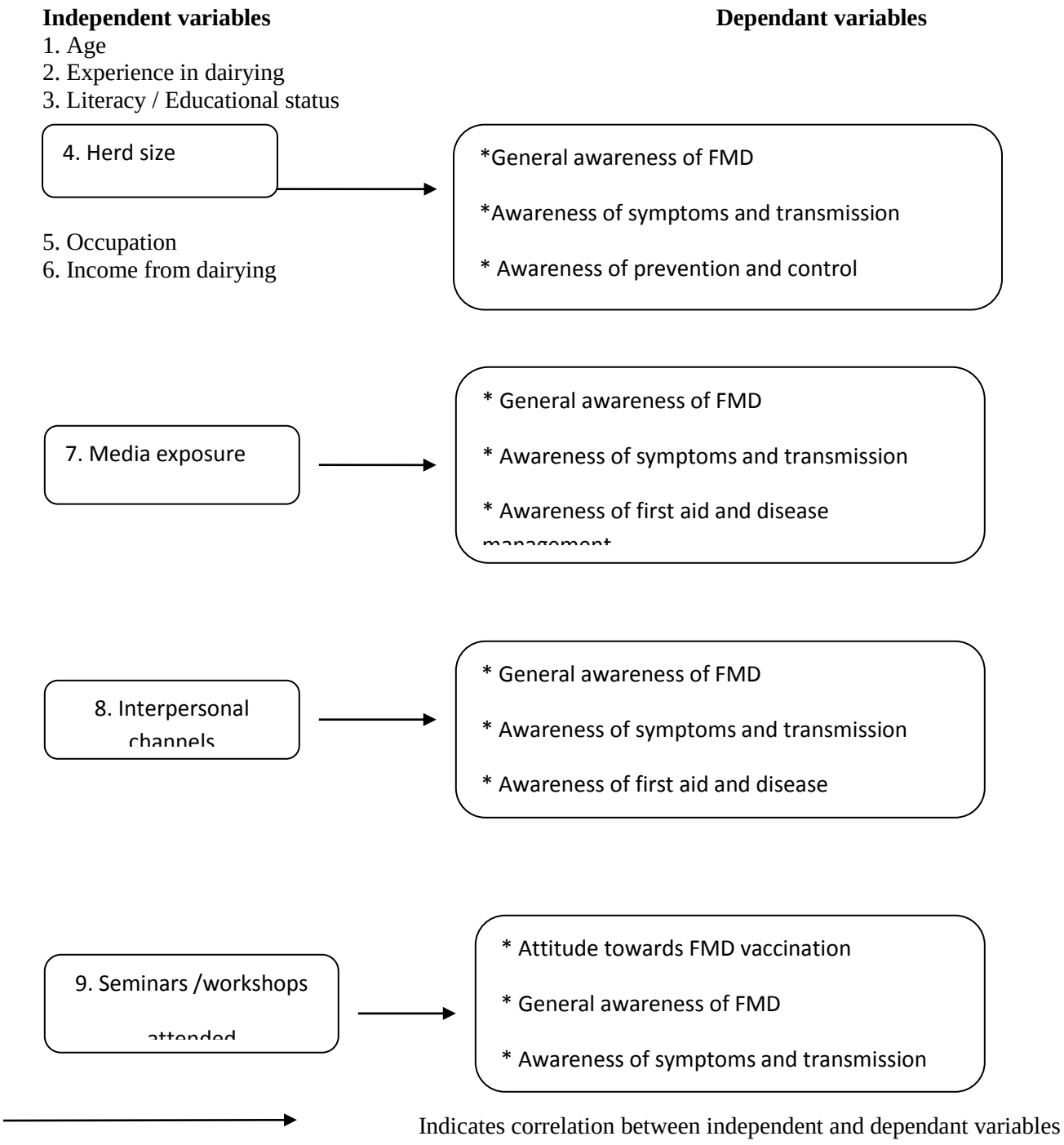
26. Education, herd size, media exposure, interpersonal channel and seminars/ workshops attended were significantly correlated with the general awareness of FMD to FMD inexperienced dairy farmers.

27. Herd size, media exposure and seminars/ workshops attended were found to be significant in explaining variations in the general awareness of FMD to FMD inexperienced dairy farmers.

28. Herd size, media exposure, interpersonal channel and seminars/ workshops attended were significantly correlated with the overall general awareness of FMD.

29. Herd size, media exposure, interpersonal channels and seminars/ workshops attended were found to be significant in explaining variations in the overall general awareness of FMD

Fig 19. Empirical model of the study



DISCUSSION

5. DISCUSSION

Discussion of the results is presented under the following heads.

5.1 Attitude towards FMD vaccination
5.2 General awareness of FMD
5.2.1 Awareness of symptoms and transmission
5.2.2 Awareness of first aid and disease management
5.2.3 Awareness of prevention and control
5.2.4 Overall general awareness
5.3 Constraints
5.3.1 Constraints in adopting control measures
5.3.2 Constraints in disease management
5.3.3 Constraints of implementing officers while undertaking FMD control measures.
5.4 Communication exposure

5.1 ATTITUDE TOWARDS FMD VACCINATION

FMD, a highly contagious and infectious disease of cattle, is not uncommon in Kerala. It causes untold suffering to the animal and heavy economic loss to the poor animal owner. 'Prevention is better than cure' is the only apt strategy in this case. Considering the above facts, Government of Kerala has launched ADCP programme making vaccination against FMD obligatory on the part of the owner. FMD control programme is specifically called 'Goraksha' and considerable publicity and other educational efforts are being undertaken apart from periodical door step vaccination. Even so, it is worth mentioning that this study has brought to light a hard fact that most of the dairy farmers studied were having only an ambivalent or neutral attitude towards FMD vaccination despite half of the farmers studied were FMD experienced

ones. That apart, it was found that between FMD experienced and in experienced dairy farmers there wasn't a significant difference in their attitude towards FMD vaccination. There could be many reasons for this ambivalent attitude towards FMD vaccination, born of a lack of confidence viz. on the quality of the vaccine, the skill of the vaccinator and after effects. It is worth mentioning here that there have been many incidences of vaccinated animals contracting FMD which has been a vociferous complaint of the cattle owners. Therefore resistance to vaccination could be common place, though Government has made it obligatory.

Sagar & Kunzuru (1993) reported that more favourable the attitude towards animal husbandry practices, greater is the adoption of that practice. They further reported a significant correlation between the adoption of vaccination against contagious diseases and attitude towards animal husbandry practices. Savitha *et al*. (2006) reported that livestock and abattoir workers of central India had a positive attitude towards vaccination and 67% were regularly vaccinating their animals. Bates *et al.* (2003) suggested that vaccination with a highly efficacious vaccine may be a cost effective strategy to control FMD.

Things can change only with an attitudinal change. In explaining functional approach to attitudes, Katz and Stotland (1959) developed the idea that people hold and express particular attitudes because they derive psychological benefit from doing so, and the type of benefit varies among the individuals. Therefore, the ways and means of bringing about attitudinal change, policy people and change agents should critically think of and be implemented. In this connection, the present study revealed that attending seminars, group discussions and lecture classes on FMD was positively and significantly correlated with the overall attitude. So much so more of seminars, group discussions and lecture classes should be organized participating dairy farmers. It is nevertheless ironical that experience in dairying was found to be negatively significant in explaining variations in the overall attitude. It means more the

experience in dairying, more the reluctance to vaccinate. It is yet another irony that formal education had no significant correlation with attitude towards FMD vaccination. Further studies are anyhow necessary to explain this phenomenon. Nonetheless, Heffernan *et al.* (2008) had reported a significant relationship between education and attitude towards vaccination and respondents having more than five years of formal education held positive view toward vaccination.

5.2 GENERAL AWARENESS OF FMD

5.2.1 Awareness of symptoms & transmission

Cattle owners should have adequate knowledge of the symptoms and spread of any contagious and infectious disease that can affect their cattle. In the absence of such knowledge, cattle owners will not be able to undertake precautionary measures, proactively or even at times of outbreak. FMD being a highly contagious and infectious disease, sufficient knowledge of it to the cattle owners is a must. The finding of the present study that the dairy farmers generally had either medium or low awareness of symptoms and transmission of FMD, somewhat agrees with the findings of Jagede *et al.* (2007) who reported that only 10.26% of people had knowledge of identifying the livestock diseases by seeing signs/ symptoms and that of George and Subhadra (2002) who reported that none of the women studied knew the symptoms of HS and RP. Even so, Kaewpitoon *et al*. (2007) reported that 55.11 % of the population had a good level of knowledge concerning the mode of transmission of liver fluke infection in cattle. Those having either medium or low awareness was more among FMD inexperienced dairy farmers than among FMD experienced and there was a significant difference. The adage ‘experience is the best teacher’ holds true, but one should not wait for an experience of a disease/outbreak to learn about it. Therefore, FMD inexperienced dairy farmers in particular should be made aware of symptoms and transmission of FMD through appropriate extension teaching methods.

The findings that, herd size, media exposure, interpersonal channels, seminars and workshops attended, were significant in explaining variations in the overall awareness of symptoms and transmission of FMD, deserves attention. Since most of them are communication variables, opportunities for interpersonal interaction should be improved.

Content analysis of the knowledge items pertaining to symptoms and transmission of FMD revealed some facts worthy of discussion. The rapid spreading nature of FMD and its transmission through air/ wind were known to a considerable majority even as majority were not knowing that FMD can be mechanically transmitted by human beings and it can be contracted from affected wild ruminants. This ignorance can lead to spread of FMD by virtue of ignoring precautionary measures for instance not restricting human movements and negligence in vaccinating domestic cattle kept near by a semi-wild milieu. Further more, there is a need to restrict the movement of domestic cattle into the forest where wild animals prevail during the time of outbreak to prevent reciprocal transmission. Micro organisms as a cause of FMD were also known to many. However, Akinola *et al.* (2008) reported that 61.4% of the respondents were only able to correctly define avian influenza as a viral infection that occurs in all species of birds. It is rather a good indication that generally the dairy farmers studied were aware of the common symptoms of FMD like fever, profuse salivation, frequent smacking of lips, stamping of feet, protrusion of tongue and the chances of abortion. The awareness of such typical signs of disease is surely of much importance as the farmers themselves can rightly identify FMD and also distinguish it from other diseases enabling them to report immediately to authorities concerned. Hopp *et al.* (2007) studied the Norwegian farmers' vigilance in reporting sheep showing scrapie associated signs were correctly checked by 34% - 69% of the farmers.

5.2.2 Awareness of first aid and disease management

FMD spreads faster and the veterinary and the para veterinary staff may not be able to reach out all outbreak cases instantly. So awareness of first aid and disease management is a must for each and every dairy farmer. In this regard it is worth stating here that majority of the dairy farmers had either medium or low awareness of first aid and disease management. Olaniyi *et al.* (2008) reported that farmers had awareness in management practices like vaccination (78.8%), control of pests and diseases (88.9%) and deworming (64.8%). There was a significant difference in the awareness of first aid and disease management between FMD experienced and inexperience dairy farmers. As was the case with awareness of symptoms and transmission, those having either medium or low awareness were more in FMD experienced than among FMD inexperienced. It has also been observed that media exposure, interpersonal channels and seminars and workshops attended were significant in explaining variations in the overall awareness of first aid and disease management. Now it becomes imperative on the part of extension agency to arrange situations so that the FMD inexperienced dairy farmers get more media exposure, interpersonal contacts and they attend more seminars, group discussions and lecture classes on FMD.

Content analysis of the knowledge items pertaining to first aid and disease management showed that only a few of the dairy farmers knew that there was no specific treatment for FMD. This lack of knowledge will invariably result in ignoring vaccination which is the important prevention strategy. Nevertheless, a large majority has realized the importance of ring vaccination around the point of outbreak. Similarly, there has been realization that visitors should be prevented during outbreak in the vicinity. The use of boric acid lotion/ ointment and honey has also been known to more than half of the dairy farmers. However, as mentioned earlier, low awareness

of first aid and disease management to the FMD inexperienced dairy farmers should draw the special attention of the extension agencies.

5.2.3 Awareness of prevention and control

Prevention & control is undoubtedly the most crucial step as for any contagious and infectious disease is concerned. Not to speak of FMD and the cattle owners should have a sufficient understanding of prevention and control for their own welfare. Majority of the FMD experienced dairy farmers had high awareness of prevention and control where as, it was medium in the case of FMD inexperienced. There was a statistically significant difference in the awareness of prevention and control of between FMD experienced and inexperienced. However, the dairy farmers in general had either medium or low awareness of prevention and control. This finding almost disagreed with that of Savitha *et al.* (2006), who reported that approximately 80% of livestock workers of Central India were aware of the vaccination concept for protecting their livestock against dreaded diseases like FMD, HS, BQ and Anthrax. However, Narmatha *et al.* (1996) reported that about 74% of the farm women had medium level of knowledge in disease control and Singh and Chander (2005) reported that only 25.83% of farmers were knowing the schedule of FMD vaccination.

It was observed that income from dairying, experience in dairying, herd size and media exposure were significant in explaining variations in the overall awareness of prevention and control. However, only herd size and media exposure were significantly correlated with the overall awareness of prevention and control of FMD. This observation is in agreement with that of Saliu *et al*. (2008) reporting that more the number of sheep and goat kept, the more was the likelihood in adopting vaccines and Abbate *et al.* (2006) reporting that knowledge of avian influenza was more in persons who had more experience. Similarly Benthem *et al.* (2002) reported a

significantly higher use of preventive measures by those having knowledge of Dengue than those without it. Akinola *et al.* (2008) too reported that high knowledge of avian influenza infection was significantly associated with adoption of preventive measures.

Content analysis of the awareness items pertaining to prevention and control of FMD had indicated that many dairy farmers knew the importance of preventive vaccination and that unvaccinated animals should not be taken to cattle fairs. Many were aware that Government of Kerala had undertaken a campaign to prevent & control FMD in the name 'Goraksha' project. A majority of the dairy farmers were informed of the safer period of gestation to vaccinate against FMD and that calves should not be allowed to suckle affected mothers. It is worth mentioning here that very few farmers were only aware of the fact that feed and fodder shall not be brought from an FMD infected region. Though the dairy farmers had high awareness of prevention and control of FMD, considering the comparatively lower awareness of FMD inexperienced farmers more of awareness programmes in a campaign mode are a must. The present extension system therefore needs to be equipped accordingly to take up this challenge.

5.2.4 Overall general awareness

The overall general awareness of FMD, transcending FMD experienced and inexperienced farmers indicated that, not even one half of the respondents studied had high awareness of FMD. Majority of the respondents were having only a medium or low awareness of FMD. This situation is not at all congenian on any account. Extension education efforts on war footing has to be undertaken so that majority of the dairy farmer population made aware of FMD.

5.3 CONSTRAINTS

5.3.1 Constraints in adopting FMD control measures.

It is important to understand the constraints/ difficulties faced by dairy farmers in adopting control measures of FMD. This has been known from the FMD experienced and inexperienced dairy farmers separately. As for the FMD experienced farmers were concerned, the major constraint in adopting control measures of FMD was the problem of wind in 'Kole' paddy field regions where most of them lived. It is rather a belief among the FMD experienced dairy farmers of the region that erratic winds bring FMD. This constraint was followed in the descending rank order, the rapidly spreading nature of FMD, farmers not reporting FMD due to the fear that milk won't be bought from them, grazing in herds, lack of adequate media publicity and reduction in milk yield due to vaccination.

In the case of FMD inexperienced farmers, the foremost constraint in adopting control measures was farm families not reporting FMD which is followed by, in the descending rank order, the rapidly spreading nature of FMD, lack of adequate media publicity, windy nature of 'Kole' regions, grazing in herds and reduction in milk yield due to vaccination.

While considering together the FMD experienced and inexperienced dairy farmers, the foremost constraint, in general, was not reporting FMD by farm families followed by, in the rank order, windy nature of 'Kole' region, rapidly spreading nature of FMD, grazing in herds, lack of media publicity, and reduction in mild yield due to vaccination. It is a matter of great concern that farmers hide the fact of disease in their animals for fear of loosing market for their milk. This is any way not an acceptable situation and the incidence of disease outbreak should be then and there reported to the authorities concerned. The situation can change only with a change in the attitude of

people. Proper awareness therefore is needed. The belief that erratic wind brings disease has at least for the time being no scientific evidence, so much so could be a myth. Right and strong awareness need to be imparted in this regard. It is anyhow a scientific truth that FMD is a rapidly spreading disease like any other highly contagious disease which makes the control difficult. Once there is an outbreak, preventive vaccination is the only solution but unfortunately many farmers resist vaccination in milch cows for fear of reduction in milk yield. Therefore the solution to tide over this problem is to vaccinate the animal in advance and that too in the owners initiate. Since lack of adequate media publicity on FMD control measures has been voiced as a constraint, extension agency should duly consider this. This is a system blame, rather than an individual blame unlike many other constraints, which the Government machinery should address. Similarly compelling the farmer to vaccinate, during a state wide vaccination drive the animals in advance pregnancy or peak milk yield is a jeopardizing situation as for the animal owner is concerned.

5.3.2 Constraints in disease management

It is worth mentioning the constraints in disease management felt by FMD experienced dairy farmers. The most felt constraint was that much time has to be spent for nursing FMD affected animals followed by the difficulty in controlling and treating the affected animals, FMD treatment is costly, unavailability of indigenous medicines, reduced income by virtue of public's abhorrence to the milk of affected animal, difficulty to apply ointment in the ulcers of foot, lack of space for isolating affected animals and the reduction in the value from FMD affected animals in that rank order. This finding is some what similar to those of many other researchers for instance; Mavi *et al.* (2006) reported that 54.29% of the respondents felt the unavailability of veterinary services during night time as one of the major constraints. Other constraints being high cost of veterinary medicine (51.43%) and veterinarian's fee (41.43%). Saliu *et al.* (2008) reported that inadequate knowledge of the vaccine

was the major constraint in adopting PPR vaccine, the extra cost for locating the veterinary agents, unavailability and the high cost of vaccines were the other major constraints reported by the same researchers. Roy *et al.* (2006) reported the communication gap to be a major constraint. Other constraints reported by them were the long distance to the veterinary hospitals, lack of faith in modern veterinary medicines, high cost of treatment and relying heavily on indigenous methods.

It was known from the dairy farmers in the process of constraint analysis that many of them being traditional dairy farmers used indigenous remedies like teak wood oil and wild pig fat for treating FMD ulcers. But according to them these are not readily available. However, these indigenous remedies require scientific validation. Since there is a belief that milk of FMD affected animals should not be use, people should be informed that boiled milk of FMD affected animals can be used. This can to some extend provide relief to the milk producers. The farmers should be compensated appropriately by the Government considering the low value of the FMD affected animals, which the farmer cannot cull as a measure of disease management.

5.3.3 Constraints of implementing officers while undertaking FMD control measures

It is worth mentioning the relevant as well as the most relevant constrains faced by the veterinarians who functioned as implementing officers of ADCP. One of the relevant constraints mentioned by the implementing officers was that false or exaggerated media reports developed a negative attitude towards vaccination among dairy farmers. No media should exaggerate or give false facts. Media should always be credible sources of information. A credible media can only help the society and media reports should help to develop a positive attitude towards vaccination highlighting the good aspects rather than the bad ones. In this regard farm journalists too have an important role. They should support the media with scientific information

and success stories periodically so that gradually a positive outlook or attitude towards FMD vaccination is created among the dairy farmers. This has to be read along some other relevant constraints reported viz. farmers have negative attitude towards FMD vaccination, there is lack of awareness of FMD among dairy farmers and lack of publicity about the details of FMD vaccination and some farmers do not feel the need of vaccination. In all these cases a positive approach of the media supported technically by farm journalists in the subject matter concerned can have wonderful results.

Treating and curing any post vaccination ailment becomes the responsibility of the veterinary surgeon and it was reported as a constraint besides the constraints that routine hospital works get disturbed by virtue of out door vaccination programme, the difficulty of field work during peak summer and rainy season and making the farmers convinced of it during door step vaccination is difficult and time consuming. The above facts justify the need for a separate full time machinery to run ADCP as mentioned earlier.

The vaccine should be stored in refrigeration to maintain cold chain. But difficulty in maintaining cold chain due to power failure is reported to be a constraint. This is rather a serious issue since the potency of the vaccine may be lost ultimately rendering all efforts worthless. The report that farmers protested as their vaccinated animals also contracted FMD, as a relevant constraint, should be seen in this context. The vaccine that was not stored properly as mentioned above might have been used in the past resulting in vaccination failure. It has already been reported as a relevant constraint that the dairy farmers lack trust in vaccines. So vaccine should be stored fool proof until its use. It has been reported that old dairy farmers showed more reluctance to vaccinate their cattle and is difficult to change their attitude. It is generally difficult to change the attitude of farmers especially the old ones. But somehow their attitude must be changed considering the importance of FMD

vaccination. Therefore all-out extension efforts should be there to convince the old dairy farmers about the importance of FMD vaccination. More of them should participate in seminars, group discussion or lecture classes about FMD. However, it has been reported as a relevant constraint, the less participation of dairy farmers in seminars, group discussion and lecture classes.

FMD vaccination is combined with ear tagging to identify the animals. But for fear of maggot wound in the injury due to ear tagging farmers won't allow vaccination. This has been reported as another relevant constraint. In this case the farmers should be taken into confidence by supplying required medicines. The ways and means of controlling animal movements during outbreak should be thought of since the unrestricted animal movement during outbreak is a reported to be a difficulty in controlling FMD during outbreak. Since these pertain to the inter-state and intra-state movement of animals, strict law enforcement may be required. Animal Husbandry department should be strengthened and empowered with the duties and responsibilities of regulating livestock movements. There should be strict vigil in terms of checkup, vaccination, quarantine etc. in check posts and other livestock movement areas like markets, slaughter houses etc.

However, the most relevant constraints reported need immediate attention of policy makers. The most relevant constraints reported were unwillingness of dairy farmers to vaccinate their animals due to reduction in milk yield, the laborious nature of door step vaccination and the possible chances of vaccination after effects like abscess, abortion and lameness. Post vaccination reduction in milk yield is a reality but for a few days. This is a post vaccination physiological phenomenon which the farmers should have viewed positively. This vaccination stress anyhow cannot be avoided. In this context, what is needed is a proper awareness among the dairy farmers about this. Technical people should see to give much media publicity on this so that the farmers are convinced rather than scared. Other after effects like abscess

formation at the site of vaccination, abortion of pregnant animals and lameness are rare occurrences. However, these are not at all acceptable after effects. Because, it creates a situation uncomfortable to the poor farmers and an undesirable propaganda. Heffernan *et al.* (2008) reported that there was a low uptake of livestock vaccination among poor farming communities in Bolivia. Negative impacts of believes such as lameness or ill health after vaccination affects vaccine adoption. How these undesirable consequences can be avoided, the implementing officers concerned should critically think. In this context, it is worth mentioning that the right procedures of vaccination must be followed at any cost. The skill of the vaccinator is also of paramount importance. Therefore appropriate training should be imparted to vaccinators. Another most relevant constraint is the laborious nature of door step vaccination. Door step vaccination is the policy of the Government. The field veterinarian along with para veterinary staff has to reach the farmer's premises to vaccinate. This is really time consuming and physically exhausting considering the difficult terrain of Kerala. There should be some solution to ease out this difficulty. One solution could be providing unlimited transportation facility to the implementing team. Nevertheless, it is better if ADCP is taken up by a permanent mechanism that is a full time machinery as mentioned elsewhere.

5.4 COMMUNICATION EXPOSURE

Media plays a paramount role in imparting animal husbandry information thereby awareness among cattle owners. Newspaper, radio, and television are very much popular in the state of Kerala. Moreover, the higher literacy of people has facilitated access to even print media. Considering the findings of the study regarding information on FMD that a large majority of the respondents got it from print media as newspaper and electronic mass media as radio and television as well as that a large majority was interested in getting information from print and electronic media viz. newspaper, radio and television, change agents should see to present information on

FMD in the appropriate mode in these media items. Extension agents shall consider the findings of the study that literature items such as magazines, weeklies, posters and newsletters were preferred only next to newspaper, radio and television. Media policies may be formulated accordingly. The observation that many dairy farmers were interested in getting information about FMD through interpersonal channels like veterinary surgeons followed by neighbours and friends, milk society workers, livestock inspectors, traditional veterinary practitioners, WSHG members and inseminators in that order, has considerable importance in communication source planning. It was any way noted that there was a high preference for veterinary surgeons as a communication source regarding FMD, indicating the relatively high credibility of this source. This finding almost agrees with that of Olaniyi *et al.* (2008) who reported that almost half (49.1%) of the farmers indicated extension agents and veterinary doctors as their source of information followed by radio and television (16.7%). However, the attention of policy personnel should fall on the fact that dairy farmers attending seminars, group discussion and lecture classes are far from satisfactory. It needs special mention here that attending seminars, group discussions and lecture classes on FMD was correlated with attitude towards FMD vaccination as well as general awareness of FMD. Therefore extension agents should organize more of seminars group discussions, lecture classes on FMD participating more of dairy farmers. The low preference for extension agents like livestock inspectors, inseminators indicates the low credibility of such sources.

6. SUMMARY

The present study, "Knowledge of Foot and Mouth Disease among dairy farmers in Thrissur district and the constraints in adopting control measures" was undertaken with the objectives of assessing the general awareness of FMD and its control measures among the selected dairy farmers, the constraints while implementing FMD control measures and the determinants of training/ educational importance. Stratified random sampling technique was adopted. One hundred and twenty dairy farmers selected from three panchayats of Thrissur district where epidemics of FMD had occurred in the year 2007 formed the sample. Out of these, sixty were those having an experience of FMD and the rest sixty were those who haven't had an experience of FMD in their cattle. Besides, a purposive sample of thirty implementing officers who were involved in FMD vaccination under ADCP was also studied.

An attitude scale was developed for the present study to measure the attitude of dairy farmers towards FMD vaccination. Most of the dairy farmers studied were having an ambivalent or neutral attitude towards FMD vaccination despite half of them being FMD experienced ones. It was observed that between FMD experienced and inexperienced dairy farmers there wasn't a significant difference in the attitude towards FMD vaccination. The study revealed that attending seminars, group discussions, and lecture classes on FMD was positively and significantly correlated with the attitude. It is nevertheless noted that experience in dairying was negatively significant in explaining variations in overall attitude. Similarly formal education had no significant correlation with attitude towards FMD vaccination. Further studies are anyhow necessary to explain these phenomena.

Cattle owners should have adequate knowledge about symptoms of diseases that affect their cattle. In the absence of such knowledge, the cattle owners won't be able to undertake precautionary measures, proactively or even during an outbreak. The present study revealed that the dairy farmers generally had either medium or low awareness of symptoms and transmission of FMD. However, between FMD experienced and inexperienced dairy farmers there was a significant difference in the awareness of symptoms and transmission of FMD. The FMD inexperienced dairy farmers were comparatively lesser aware of symptoms and transmission. Therefore their awareness need to be enhanced. Herd size, media exposure, interpersonal channels seminars and workshops attended were significant in explaining variations in overall awareness of symptoms and transmission of FMD. Content analysis of the knowledge items pertaining to symptoms and transmission revealed that the rapid spreading nature of FMD and its transmission through air/ wind were known to a considerable majority even as majority were not knowing that FMD can be mechanically transmitted by human beings and it can be contracted from the affected wild ruminants. Micro organisms as a cause of FMD were also known to many.

FMD spreads faster and the veterinary and para veterinary staff may not be able to reach out all outbreak cases instantly. So awareness of first aid and disease management is a must for each and every dairy farmer. In this regard it is worth stating that majority of the dairy farmers had either medium or low awareness of first aid and disease management. However, as was the case with awareness of symptoms and transmission, FMD inexperienced dairy farmers had relatively lesser awareness of first aid and disease management. This difference in awareness between FMD experienced and inexperienced dairy farmers was statistically significant. Further, media exposure, interpersonal channels, seminars and workshops attended were found significant in explaining variations in the awareness of first aid and disease management. Now it becomes imperative on the part of extension agency to arrange situations so that the FMD inexperienced dairy farmers get more media exposure,

exposure to interpersonal communication and they attend more seminars, group discussions and lecture classes on FMD. Content analysis of the knowledge items pertaining to first aid and disease management showed that only a few of the dairy farmers knew that there wasn't any specific treatment for FMD. Nevertheless, a large majority realized the importance of ring vaccination around the point of outbreak. However, the low awareness of first aid and disease management of FMD inexperienced dairy farmers should draw the special attention of the extension agencies.

Prevention and control is undoubtedly the most crucial step as for any contagious disease is concerned. Dairy farmers in general had medium or low awareness of prevention and control. FMD experienced dairy farmers had better awareness of prevention and control as compared to FMD inexperienced ones. Income from dairying, experience in dairying, herd size and media exposure were significant in explaining variations in the overall awareness of prevention and control. However, only herd size and media exposure were significantly correlated with the overall awareness of prevention and control of FMD. Content analysis of the awareness items pertaining to prevention and control of FMD had indicated that many dairy farmers knew the importance of preventive vaccination. Many were aware that Government of Kerala had undertaken a campaign to prevent and control FMD in the name 'Goraksha' project. Very few dairy farmers were only aware of the fact that feed and fodder should not be brought from FMD infected region. A knowledge test was developed to measure the general awareness of FMD among dairy farmers.

Regarding constraints/ difficulties faced by dairy farmers in adopting control measures, the foremost constraint in general was not reporting the disease by farm families followed by, in the rank order, windy nature of 'Kole' region, rapidly spreading nature of FMD, grazing in herds, lack of media publicity and reduction in milk yield due to vaccination.

Regarding constraints in disease management, the most felt constraint was that much time has to be spent for nursing FMD affected animals followed by the difficulty in controlling and treating affected animals, the high treatment cost, unavailability of indigenous medicines, reduced income by virtue of public's abhorrence to the milk of affected animals, difficulty in applying ointment in the ulcers of foot, lack of space to isolate affected animals and the reduction in the value of FMD affected animals, in that rank order. Delphi methodology was applied to study the constraints faced by the dairy farmer in adopting FMD control measures and disease management.

Regarding the constraints of implementing officers to undertake FMD control measures, the most relevant constraints reported were unwillingness of dairy farmers to vaccinate their animals due to reduction in milk yield, the laborious nature of door step vaccination and the possible chances of vaccination after effects like abscess, abortion and lameness, in that order.

Considering the findings of the study that a large majority got information of FMD from print media as newspaper, electronic mass media as radio and television and that a large majority was interested in getting information from print and electronic media viz. newspaper, radio and television, change agents should see to present information on FMD in these media items in the appropriate mode. The observation that many dairy farmers were interested in getting information through interpersonal channels like veterinary surgeons followed by neighbours and friends, milk society workers, livestock inspectors, traditional veterinary practitioners, WSHG members and inseminators in that order, has considerable importance in communication source planning. It is noted that there is a high preference for veterinary surgeon as a communication source regarding FMD indicating the relatively high credibility of the source. It needs special mention here that attending seminars, group discussions and lecture classes on FMD was correlated with attitude

towards FMD vaccination and general awareness of FMD and hence organizing them periodically and participating the dairy farmers in good number is of paramount significance.

Suggestions

1) A state wide socio- economic study on FMD.

2) An evaluation study on ADCP.

3) A holistic study on communication source utilization pertaining to FMD.

4) A content analysis to develop a training curriculum on FMD.

5) A study on indigenous beliefs and practices pertaining to FMD.

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APPENDICES

APPENDIX-I

Kerala Agricultural University
College of Veterinary and Animal Sciences, Mannuthy, Thrissur-680651
Department of Veterinary and Animal Husbandry Extension Education

KNOWLEDGE OF FOOT AND MOUTH DISEASE AMONG DAIRY FARMERS IN THRISSUR DISTRICT AND THE CONSTRAINTS IN ADOPTING CONTROL MEASURES

Interview schedule

Dr. Subin K.Mohan
M.V.Sc. Scholar

1. Name of the respondent :
2. Address of the respondent :
3. Ward :
4. Village :
5. Panchayat :
6. Sex : a) Male b) Female

7. Age : ……years

8. Whether FMD had been occurred in the year 2007: a) Yes B) No

9. Educational qualification :
   a) Illiterate b) Primary c) Schooling
   d) Pre-degree/ plus two e) Degree f) Post graduate

10. Religion : a) Hindu b) Christian c) Muslim

11. Main occupation : ……
12. Subsidiary Occupation : ……
13. Income from main occupation: ……
14. Income from subsidiary occupation: ……
15. Income from dairying : ……..
16. Experience in dairying : ……..

17. Herd size :
    a) Cow:……. b) Bull: ……..c) Calf : ……. d) Bullock : …….
    e) She-buffalo : … ……..f) He-buffalo: …… g) Buffalo calf : ……h) Heifer :

18. Tick (√) your information source of FMD

Sl.No.	Information source	Tick
A	**Media exposure**	
1	News Paper	
2	Weekly	
3	Monthly	
4	New letter	
5	Poster	
6	Radio	
7	Television	
B	**Interpersonal channels**	
1	Friends	
2	Neighbours	
3	Traditional veterinary practitioners	
4	Veterinary surgeon	
5	Livestock inspector	
6	Inseminators	
7	Milk society workers	
8	WSHG members	
C	**Seminars and workshops attended**	
1	Seminar	
2	Group discussion	
3	Lecture class	

19. Are you interested in getting information of FMD through media: a) Yes b) No

20. Rank media according to your preference in getting information of FMD.

Sl.No.	Media	Rank
1	News Paper	
2	Weekly	
3	Monthly	
4	New letter	
5	Poster	
6	Radio	
7	Television	

19. Are you interested in getting information of FMD through inter personal channels : a) Yes b) No

20. Rank interpersonal channels according to your preference in getting information of FMD.

Sl.No.	Interpersonal channels	Rank
1	Friends	
2	Neighbours	
3	Traditional veterinary practitioners	
4	Veterinary surgeon	
5	Livestock inspector	
6	Inseminators	
7	Milk society workers	
8	WSHG members	

21. If you had attended any seminars/ group discussions/ lecture classes on FMD, name the organizers of it. : …….

22. Are you interested in attending seminars/ group discussions/ lecture classes on FMD: a) Yes b) No

Knowledge of Foot and Mouth Disease

Dear friend,

Please indicate the correct answer of the following questions by a tick mark (√) in the appropriate space given below.

I) Awareness of symptoms and transmission

A. The following is an admixture of some true and false items. Please indicate as to whether the item is 'TRUE/ FALSE. If you do not know anything about it, please indicate your response as 'DON'T KNOW'.

1) Fever is a symptom of FMD.

True	False	Don't Know

2) Formation of vesicles in the mouth, inter digital space and udder is a symptom of FMD

True	False	Don't Know

3) In the case of FMD, fever subsides after the formation of vesicles

True	False	Don't Know

4) Profuse salivation is a symptom of FMD

True	False	Don't Know

5) Protrusion of tongue is a symptom of FMD

True	False	Don't Know

6) Frequent smacking of lips is a sign of FMD

True	False	Don't Know

7) In FMD infected animals, shedding of hooves can be noticed

True	False	Don't Know

8) FMD infected pregnant animals may abort

True	False	Don't Know

9) Stamping of feet is a symptom of FMD.

True	False	Don't Know

10) Vesicles are first seen on the tongue

True	False	Don't Know

11) FMD is a rapidly spreading disease

True	False	Don't Know

12) FMD can be transmitted through air

True	False	Don't Know

13) Visitors to farms may lead to spread of FMD

True	False	Don't Know

14) Wild ruminants like gaur, sambar deer, deer etc carry infection from one place to another

True	False	Don't Know

B. Please indicate the most appropriate answer by a tick mark ( ) from the alternatives given under each of the following items.

15) Foot and Mouth Disease is caused by
a) Micro organisms b) Chemicals c) Toxic plants

II) Awareness of first aid and disease management

A-The following is an admixture of some true and false items. Please indicate as to whether the item is 'TRUE/ FALSE. If you do not know anything about it, please indicate your response as 'DON'T KNOW'

16) There is no specific treatment for FMD

True	False	Don't Know

17) Antibiotics are given for treating secondary bacterial infections

True	False	Don't Know

18) Boric acid lotion is used to wash ulcers in mouth

True	False	Don't Know

19) Boric acid ointment should be applied to heal the ulcers

True	False	Don't Know

20) Boric acid and honey should be applied in mouth to relieve pain

True	False	Don't Know

21) Visitors should be prevented from visiting farms in cases of outbreak in the vicinity

True	False	Don't Know

22) Ring vaccination has to be practiced in a radius of 5 km keeping the point of infection as centre

True	False	Don't Know

III) Awareness of prevention and control

A. The following is an admixture of some true and false items. Please indicate as to whether the item is 'TRUE/ FALSE. If you do not know anything about it, please indicate your response as 'DON'T KNOW'

23) The 'Goraksha' project aims to prevent and control FMD in Kerala

True	False	Don't Know

24) Unvaccinated animals should not be allowed in cattle fairs

True	False	Don't Know

25) Calves should not be allowed to suckle affected mothers

True	False	Don't Know

B. Please indicate the most appropriate answer by a tick mark ( ) from the alternatives given under each of the following items.

26) Vaccinated animals should be brought to a village only after --------days

A. 15 days b.1 month c. 6 months

27) Avoid fodder from a place were FMD is reported for a period of at least ---- months

a. 6 months b. 3 months c. 1 month.

28) Upto which period of gestation, pregnant animals can be vaccinated against FMD
a) Can be vaccinated at any time of gestation
b) Only upto 7 months
c) Only upto 5 months

Attitude towards FMD vaccination

Please indicate your attitude towards the following statements by a tick mark (√) in the appropriate column

No	Attitude statements	SA	A	UC	D	SD
1	I think all susceptible livestock species should be vaccinated to effectively control FMD					
2	I don't prefer to vaccinate my calves as it may cause lameness					
3	I should not give FMD vaccination since it may lower milk yield					
4	I believe that vaccinated animals cannot contract FMD					
5	I should abstain from FMD vaccination as calves may die of it					
6	I am prepared to face the consequences of not vaccinating against FMD					
7	Though I stay and keep the livestock in an isolated place, vaccination is relevant					
8	I don't prefer to vaccinate my livestock against FMD as it may cause fever					
9	I believe in the natural resistance of animals to diseases rather than in vaccination					
10	It is rather not out of Governments compulsion that I vaccinate my livestock					
11	I abstain from FMD vaccination as it may cause swelling at the site of vaccination					
12	I would prefer FMD vaccination if only it is free of cost					

SA- Strongly agree A- Agree UC-Uncertain D-Disagree SD-Strongly disagree

Constraints

A) Constraints in adopting control measures

Select any three constraints and rank them

Sl.No.	Constraints	Rank
1	FMD vaccination will result in reduction in milk yield	
2	Lack of adequate media publicity on FMD control measures	
3	FMD spreads rapidly	
4	Since in 'Kole' paddy field regions, wind is more, the control of FMD is difficult.	
5	Since livestock are taken to paddy fields for grazing in herds, control is difficult.	
6	Won't report FMD due to the fear that if the public knew about the disease they will not buy milk from them	

B) Constraints in disease management

Select any three constraints and rank them

Sl.No.	Constraints	Rank
1	FMD treatment is costly	
2	Much time has to be spent for nursing FMD affected animals	
3	Lack of space for isolating the affected animals.	
4	Reduction in the value of FMD affected animals	
5	Controlling and treating affected animals suffering from pain is cumbersome.	
6	Unavailability of teak wood oil and wild pig fat as folk medicines.	
7	Difficulty to apply ointments to the ulcers in foot	
8	Belief that milk of the affected animal should not be used, decreases income	

APPENDIX-II

Difficulty indices (P) and discrimination indices ($E_{1/3}$) of the 72 items of knowledge test on FMD.

Sl.No.	Frequencies of correct answers for each group of respondents N=10 for each group				Difficulty Index (P)	Discrimination index ($E_{1/3}$)
	G1	G2	G5	G6		
1.	10	10	4	8	76.7	0.4*
2.	9	11	6	6	75	0.4*
3.	8	5	0	1	35	0.6*
4.	10	11	5	5	76.7	0.55*
5.	9	12	7	7	83.3	0.35
6.	9	11	2	1	50	0.85*
7.	8	10	0	2	43.3	0.8*
8.	10	12	8	7	88.3	0.35
9.	10	12	6	5	83.3	0.55
10.	10	12	7	8	91.7	0.35
11.	9	12	4	5	65	0.6*
12.	4	2	0	2	16.7	0.2
13.	6	8	0	1	31.7	0.65*
14.	5	3	2	2	25	0.2
15.	4	2	2	0	20	0.2
16.	9	9	5	8	76.7	0.25
17.	10	9	6	5	76.7	0.4*
18.	7	7	5	2	53.3	0.35*
19.	9	12	4	5	78.3	0.6*
20.	8	10	8	4	71.7	0.3
21.	8	12	10	8	93.3	0.1
22.	9	12	9	5	81.7	0.35*
23.	8	8	7	3	66.7	0.3
24.	10	10	2	4	60	0.7*
25.	10	9	3	4	50	0.6*
26.	9	7	7	1	51.7	0.4*
27.	7	3	3	4	36.7	0.15
28.	10	12	9	4	85	0.45
29.	5	9	4	4	45	0.3
30.	10	11	10	5	88.3	0.3
31.	10	12	10	8	96.7	0.2
32.	8	4	2	3	33.3	0.35*
33.	8	6	1	1	41.7	0.6*

34.	10	11	9	4	83.3	0.4
35.	9	7	2	0	41.7	0.7*
36.	4	4	0	0	20	0.4
37.	10	10	6	0	58.3	0.7*
38.	10	7	6	0	51.7	0.55*
39.	4	4	4	0	33.3	0.2
40.	10	12	9	7	91.7	0.3
41.	10	12	8	10	96.7	0.2
42.	10	12	9	10	96.7	0.15
43.	7	4	2	3	38.3	0.3
44.	5	4	3	2	38.3	0.2
45.	10	11	7	4	81.7	0.5*
46.	10	11	7	4	80	0.5*
47.	10	11	5	3	75	0.65*
48.	7	8	8	6	75	0.05
49.	10	12	8	8	93.3	0.3
50.	10	10	7	5	81.7	0.4*
51.	10	12	10	9	98.3	0.15
52.	10	11	10	9	95	0.1
53.	8	10	9	9	81.7	0
54.	7	7	3	2	40	0.45*
55.	3	7	3	0	33.3	0.35*
56.	6	5	4	1	35	0.3
57.	9	8	6	6	70	0.25
58.	3	3	0	0	11.7	0.3
59.	7	8	7	5	65	0.15
60.	6	6	3	2	40	0.35*
61.	9	10	9	8	88.3	0.1
62.	10	11	10	9	95	0.1
63.	10	12	10	10	100	0.1
64.	10	10	8	8	90	0.2
65.	10	11	9	10	96.7	0.1
66.	10	12	10	8	93.3	0.2
67.	9	11	8	5	81.7	0.35*
68.	8	8	6	9	73.3	0.05
69.	9	12	7	6	85	0.4
70.	3	0	3	1	18.3	-0.05
71.	5	4	2	1	35	0.3
72.	7	7	8	5	63.3	0.05

* Items selected

APPENDIX- III

't' values of attitude statements of FMD vaccination

Sl.No.	Attitude statements	t value
1	I like my cattle to be vaccinated against FMD at proper time	2.32
2	I believe that prevention is better than cure	2.4
3	I believe vaccination to be the most important measure to prevent FMD	2.83
4	I don't think FMD can be totally eradicated through methodical vaccination	1.13
5	I think all susceptible livestock species should be vaccinated to effectively control FMD	3.58*
6	If only my neighbour farmer vaccinates his livestock that I too vaccinate	2.5
7	I don't prefer to vaccinate my calves as it may cause lameness	3.59*
8	I don't mind even taking my animal to the veterinary hospital for vaccination	1.63
9	I don't prefer to vaccinate my livestock since they are after all animals	3.46
10	I believe vaccination against FMD is meaningless as there is uncontrolled trafficking of livestock	2.63
11	I believe that even vaccinated animals can contract FMD	3.65*
12	As I stay and keep the livestock in an isolated place, vaccination is irrelevant	7.93*
13	I decide to vaccinate my livestock against FMD even if somebody says even vaccinated animals contract FMD	3.29
14	I think that FMD is recurring because of vaccination only	2.65
15	I believe FMD vaccination failures are common	3.11
16	I should not give FMD vaccination since it may lower milk yield	3.54*
17	I should abstain from FMD vaccination as calves may die of it	7*
18	I would prefer FMD vaccination if only it is free of cost	3.48*
19	I am prepared to face the consequences of not vaccinating against FMD	4.22*
20	Why after all those who believe in nature cure should vaccinate	1.89
21	I don't prefer to vaccinate my livestock against FMD as it may cause fever	4.9*
22	I believe in the natural resistance of animals to diseases rather than in vaccination	4.24*
23	My opinion is that there should be strong media campaigns to make people aware of the significance of FMD vaccination	1.41
24	I don't like to advice my neighbours about the relevance of FMD vaccination	2.61
25	It is out of Governments compulsion that I vaccinate my livestock	3.5*

Sl.No.	Attitude statements	t value
26	I don't prefer to vaccinate my livestock against FMD even during their early pregnancy	2.21
27	Vaccination of livestock is as important as that of human beings	2.23
28	It is rather the moral responsibility of any livestock owner to keep his animal free of pain and distress	1.11
29	I don't vaccinate my livestock against FMD since they may collapse	2.44
30	I am afraid; I may loose my animal if not vaccinated against FMD	3.02
31	I abstain from FMD vaccination as it may cause swelling at the site of vaccination	4.1*
32	I don't think my inconveniences of vaccinating my livestock to be more important than the distress due to FMD	2.48
33	I am prepared to give whatever possible assistance required in organizing FMD vaccination camps in my village	2.86
34	I feel that it is high time many awareness classes about FMD and vaccination were organized in my village	0.67
35	I feel that modest punishment should be given to whoever denies FMD vaccination	2.12
36	I feel that those livestock owners methodically vaccinating against FMD should be rewarded	3.05

* Items selected

APPENDIX-IV

1.0 CONSTRAINTS

1.1 Constraints in adopting control measures

Sl.No	Constraints	A	DA	AC	CC	S	OC
1	FMD vaccination will result in reduction in milk yield						
2	Vaccination results in abortion.						
3	Vaccination results in downer.						
4	Vaccination results in edema and abscess.						
5	Vaccination results in lameness in calves.						
6	Taking animals to the abattoir without any precaution or control.						
7	Vaccination without checking health status of animal.						
8	Insufficient advices from veterinary hospital regarding control.						
9	Ineffective media publicity.						
10	Lack of adequate media publicity on FMD control measures						
11	Costly when the herd size in large.						
12	I haven't a favourable outlook towards FMD vaccination.						
13	FMD spreads rapidly						
14	Since in 'Kole' paddy field regions, wind is more, the control of FMD is difficult.						
15	Bringing draft bullocks for work in paddy fields makes FMD control difficult.						
16	Fear that vaccination results in other diseases.						
17	No one to take animals to the vaccination camps						
18	Since livestock are taken to paddy fields for grazing in herds, control is difficult.						
19	Bringing unvaccinated animals from other places brings control difficult.						
20	Bringing animals from other states for distribution under government schemes makes control difficult.						
21	Animals brought for draft purpose are not inspected properly by authorities concerned.						

Sl.No	Constraints	A	DA	AC	CC	S	OC
22	Won't report FMD due to the fear that if the public knew about the disease, they will not buy milk from them						

A- Agree **DA-** Disagree **AC-** Any change in the opinion, if so reasons

CC- Causal constraints **S-** Solutions **OC-** Any other constraints

1.2 Constraints in disease management

Sl.No	Constraints	A	DA	AC	CC	S	OC
1	FMD treatment is costly						
2	Much time has to be spent for nursing FMD affected animals						
3	Most time has to be spent for managing animals cured of FMD.						
4	Non availability of timely treatment.						
5	Ignorance of first aid.						
6	Lack of space for isolating the affected animals.						
7	Inexperience in nursing the sick animals.						
8	Ill health of the cattle owner						
9	Reduction in the value of FMD affected animals						
10	Preoccupation makes it difficult to attend the sick animals.						
11	Weakness of the animals to take it to the hospitals.						
12	Assistance of others is required to nurse the diseased animals, especially foot ulcers.						
13	Casting of sick animals can be sometimes dangerous.						
14	Controlling and treating affected animals suffering from pain is cumbersome.						

Sl.No	Constraints	A	DA	AC	CC	S	OC
15	Hesitating to help others for fear of FMD.						
16	Helpers are to be paid.						
17	Unavailability of teak wood oil and wild pig fat as folk medicines.						
18	More belief in indigenous medicines as compared to modern medicines.						
19	Difficulty to apply ointments to the ulcers in foot						
20	Belief that milk of the affected animal should not be used, decreases income						
21	Mentally distressing to see the animals suffering from FMD.						
22	Lack of specific treatment makes disease management difficult.						
23	Unavailability of medicines in times makes disease management difficult.						

A- Agree **DA-** Disagree **AC-** Any change in the opinion, if so reasons

CC- Causal constraints **S-** Solutions **OC-** Any other constraints

KNOWLEDGE OF FOOT AND MOUTH DISEASE AMONG DAIRY FARMERS IN THRISSUR DISTRICT AND THE CONSTRAINTS IN ADOPTING CONTROL MEASURES

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ABSTRACT

Dairy farmers generally had an ambivalent or neutral attitude towards FMD vaccination. Between FMD experienced and inexperienced there wasn't a significant difference in the attitude. Attending seminars, group discussions and lecture classes on FMD was positively and significantly correlated with attitude. Awareness of symptoms and transmission, first aid and disease management and prevention and control measures were generally found to be either medium or low. However, FMD inexperienced had comparatively lower awareness. Media exposure, exposure to inter personal channels of communication, seminars and workshops attended were found significant in explaining variations in the general awareness of FMD. Regarding constraints faced by farmers in adopting control measures, the foremost one was farm families hiding or not reporting that their cattle was FMD affected. In the case of disease management, the foremost constraint reported was the much time consuming nursing process of affected animals. The most relevant constraints reported by the implementing officers of FMD vaccination programme were unwillingness of dairy farmers to vaccinate their animals due to reduction in milk yield, the laborious nature of door step vaccination and the possible chances of vaccination after effects like abscess formation, abortion and lameness.