



UNIVERSITI PUTRA MALAYSIA

**PRELIMINARY SURVEY: ASSOCIATION BETWEEN FARMER'S
AWARENESS AND COMPLIANCE ON HERD HEALTH PROGRAM
AMONG FIVE DAIRY CATTLE FARMS OF PROGRAM LADANG
ANGKAT, FPV, UPM.**

NOOR HANANI BT MAT ISA

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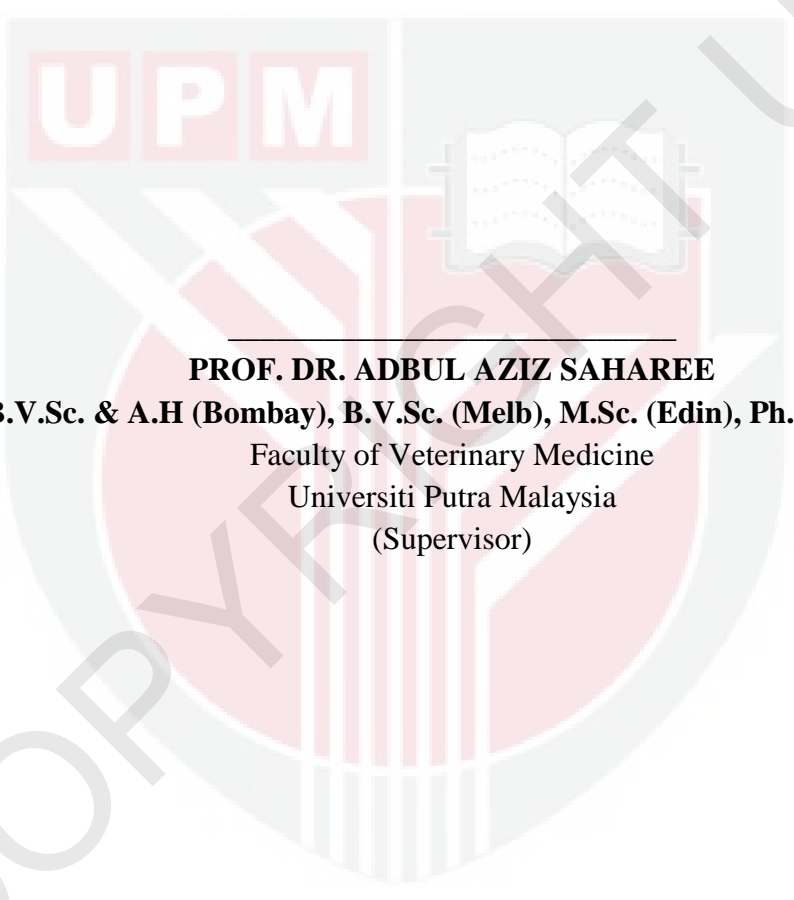
**A PRELIMINARY SURVEY: ASSOCIATION BETWEEN FARMER'S
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ANGKAT, FPV, UPM.**

NOOR HANANI BT MAT ISA

A project paper submitted to the
Faculty of Veterinary Medicine, Universiti Putra Malaysia
In partial fulfilment of the requirement for the
DEGREE OF DOCTOR OF VETERINARY MEDICINE
Universiti Putra Malaysia
Serdang, Selangor Darul Ehsan

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It is hereby certified that we have read this project paper entitle “A Preliminary Survey on Association Between Farmer’s Awareness and Compliance on Herd Health Program (HHP) among Five Dairy Cattle Farms of Program Ladang Angkat of Faculty Of Veterinary Medicine (FPV), University Putra Malaysia (UPM), by Noor Hanani Bt Mat Isa and in our opinion it is satisfactory in terms of scope, quality and presentation as partial fulfilment of the requirement for course VPD 4901.



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DEDICATION

*In the name of Allah S.W.T, the most beneficent and merciful,
this thesis is dedicated to all veterinarians and farmers whose
locate their soul sincerely in improvement of ruminant
industry.*



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Supervisor: Prof. Dr. Abdul Aziz bin Saharee

Co-Supervisor: Dr. Faez Firdaus Jesse Abdullah, Prof. Dr. Abdul Wahid Haron

My family, my best friend and her family, Nur Haizan bt Abdul Rahman

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CONTENTS

TITLE.....
CERTIFICATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS.....	iv
CONTENTS.....	v
LIST OF FIGURE.....	vii
ABSTRAK.....	viii
ABSTRACT.....	x
1.0 INTRODUCTION.....	1
2.0 LITERATURE REVIEW.....	3
2.1 Definition of herd health management.....	3
2.2 Evolution of Practices in Dairy Cattle Veterinary Medicine.....	3
2.3 Herd Health Management Conceptual Cycle.....	4
2.4 Component of herd health program.....	4
2.5 Successful animal performance as effects of HHP.....	5
3.0 MATERIALS AND METHODS.....	6
3.1 Study Design.....	6
3.2 Data Collection.....	7
3.3 Data Analysis.....	7
RESULTS.....	9
DISCUSSION.....	14
CONCLUSION.....	19
RECOMMENDATION.....	19
REFERENCES.....	20
APPENDICES.....	23

LIST OF TABLES

	Page
Table 1 : Data on Farm management and herd population.....	20
Table 2 : Descriptive statistic of farmers' awareness and compliance on 14 components of HHP.....	22
Table 3 : Spearman's rho correlation with $H_0: \rho = 0$; $H_A: \rho \neq 0$	23
Table 4 : Categorization of correlation effect.....	23



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LIST OF FIGURE

	Page
Figure 1 : Figure 1. A schematic representation of practices evolution in dairy cattle medicine over last 25 years.....	14
Figure 2 : Bar chart of farmer compliance on each component of HHP (%).....	22
Figure 3 : Bar chart of correlation between level of farmer awareness and compliance on component of HHP.....	24

ABSTRAK

Abstrak daripada kertas project yang dikemukakan kepada Fakulti Perubatan Veterinar untuk memenuhi sebahagian daripada keperluan Kursus VPD 4901- Projek

**KAJI SELIDIK AWAL: KAITAN ANTARA KESEDARAN DAN
KEPATUHAN LIMA PENTERNAK LEMBU TENUSU PROGRAM
LADANG ANGKAT, FPV, UPM TERHADAP PROGRAM KESIHATAN
KELOMPOK**

Oleh

Noor Hanani Bt Mat Isa

2015

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Industri tenusu di Asia tropika telah gagal untuk terus bergerak mengikut arus pembangunan tenusu di negara barat selama beberapa dekad. Ladang-ladang lembu tenusu telah bertambah dalam jumlah ternakan lalu fokus pengurusan telah beralih daripada pendekatan rawatan kepada pencegahan. Untuk membantu penternak mengatasi perubahan ini, program kesihatan kelompok (HHP) telah diperkenalkan kepada penternak lembu tenusu Program Angkat Ladang. Walaubagaimanapun, selepas beberapa tahun memperkenalkan HHP kepada penternak, tahap kepatuhan penternak terhadap HHP masih tidak diketahui. Maka, tujuan projek ini adalah untuk mengenalpasti tahap kepatuhan penternak terhadap

14 komponen dalam HHP, untuk mengenalpasti kaitan antara kesedaran dan kepatuhan penternak terhadap HHP, serta akan mencadangkan beberapa asas HHP kepada para penternak selepas mengenal pasti faktor kekurangan yang membuat penternak sukar mencapai matlamat ladang mereka. Semua ladang angkat lembu tenusu telah diberi borang soal selidik, persekitaran ladang diperhatikan dan penternak ditemubual pada masa yang sama. Jumlah peratus kesedaran dan kepatuhan penternak terhadap setiap komponen HHP dikira menggunakan Microsoft Office Excel dan kaitan antara kesedaran penternak dan kepatuhan penternak dianalisa menggunakan Spearman's rho. Pekebun sedar tetapi tidak semestinya mematuhi HHP berdasarkan purata peratus kesedaran penternak lebih tinggi daripada purata peratus kepatuhan penternak. Bagaimanapun, terdapat korelasi positif rendah yang bererti antara kedua-dua pembolehubah. Kertas ini membincangkan faktor-faktor yang mempengaruhi kepatuhan HHP diikuti oleh beberapa cadangan untuk penambahbaikan komponen HHP yang mendapat peratus kepatuhan penternak yang rendah untuk membantu penternak mencapai matlamat-matlamat ladang mereka. Peningkatan kepatuhan penternak terhadap HHP dapat membantu untuk meningkatkan industri ruminan Malaysia secara beransur-ansur.

Kata kunci : kaji selidik awal, soal selidik, kepatuhan penternak, lembu tenusu.

ABSTRACT

An abstract of the project paper presented to the Faculty of Veterinary Medicine in partial fulfilment of the course VPD 4999- Project

**A PRELIMINARY SURVEY: ASSOCIATION BETWEEN FARMER'S
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By

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2015

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Dairy industry in tropical Asia has failed to keep in line with the speed of dairy development in western countries over decades. Thus, dairy cattle farms tend to increase in animal number, hence management focus have been shifted from curative to preventive approach. To help the farmers cope with the changes, herd health program (HHP) was introduced to dairy cattle farm of Program Ladang Angkat (PLA). Since introduction of HHP to the farmers in September 2011, the level of farmer compliance and awareness on HHP remains unknown. Thus, the aims of this study are to determine the level of farmers' awareness and compliance on 14 components in HHP, to determine association between farmer's awareness and

compliance on HHP as well as to recommend some basic HHP to the farmers after identifying the factors that were lacking in order to achieve their goals. All dairy cattle farms of PLA (n=5) were assessed using questionnaire and the farms' environment were observed during the visit. Total percentage of farmer compliance and awareness on each component of HHP was calculated using Microsoft Office Excel and the association between farmer's awareness and compliance were analysed using Spearman's rho. Farmers were aware but did not necessarily comply on HHP according to mean of farmer's awareness percentage was higher than mean of farmer's compliance percentage. There was significant low positive correlation between both variables. Factors affecting farmers' compliance were identified and recommendations were suggested especially for component with low score. Thus, improving farmer compliance on HHP can gradually help to improve our ruminant industry.

Key words: preliminary survey, questionnaire, farmer's compliance, dairy cattle

1.0 INTRODUCTION

Tropical climate in Malaysia is not ideal for dairy farming as high temperature, humidity and rainfall cause reduction in both, nutritive value of available forage and cow comfort (Moran, 2013). Even with these unfavourable conditions, the Department of Veterinary Services report of 2013 showed a milk production of 38.7mil.litres in 2004 and 79.35mil.litres in 2013 equivalent to self-sufficiency level of 2.98% and 9.30%). Malaysia took a while to increase the milk production and self-sufficiency level to just about two to three folds over 10 years. The constraint may be due to lack of farmers' knowledge, technical skill, awareness and compliance in herd health management (Moran, 2013). According to Sol and Renkema (1984); Hogeveen et al., (1992) and Derks et al.,(2012), the concept of herd health program (HHP) which is integrating herd health, animal welfare, public health and food quality assurance had shown to be effective to improve farm productivity in the past and also at present (Derks et al., 2014). To help solve the issue of low productivity among the small holder farmers, a programme was introduced in September 2011 by the Faculty of Veterinary Medicine (FVM), Universiti Putra Malaysia (UPM) to the farmers. The initiative is Program Ladang Angkat (PLA). Smallholder ruminant farmers within the vicinity of 40km from the faculty were invited to join PLA. PLA is the first win-win program where farmers will get free consultation and education on aspects related to livestock herd health management. In addition, their animals also will get free diagnosis and treatment. In return the farmers will allow veterinary student to do their practical hands-on clinical

practice on the farms supervised by the consultants of the University Veterinary Hospital.

Basically, the implementation of HHP of Ladang Angkat consists of several stages which emphasize on observation, implementation of followed by systematic analysis on the impact and compare with the set target. Therefore, after 3 years of implementation, it is timely to find out the status of the farmers' awareness to HHP and their compliance in the herd health management.

Therefore the objectives of this study are;

- 1.) to determine Ladang Angkat's dairy cattle farmers' awareness and compliance level towards HHP,
- 2.) to determine association between farmers' awareness and compliance toward HHP,
- 3.) to recommend basic and practical herd health program to be implemented on the farms.

2.0 LITERATURE REVIEW

2.1 Definition of herd health management

Herd health management has been defined as a combination of guidance on herd health promotion, improvement of productivity and disease prevention within economic limit of farmer and industry, while integrating animal welfare, food safety, public health and environmental sustainability (Noordhuizen and Metz, 2005; LeBlanc et al., 2006; Derks et al., 2013).

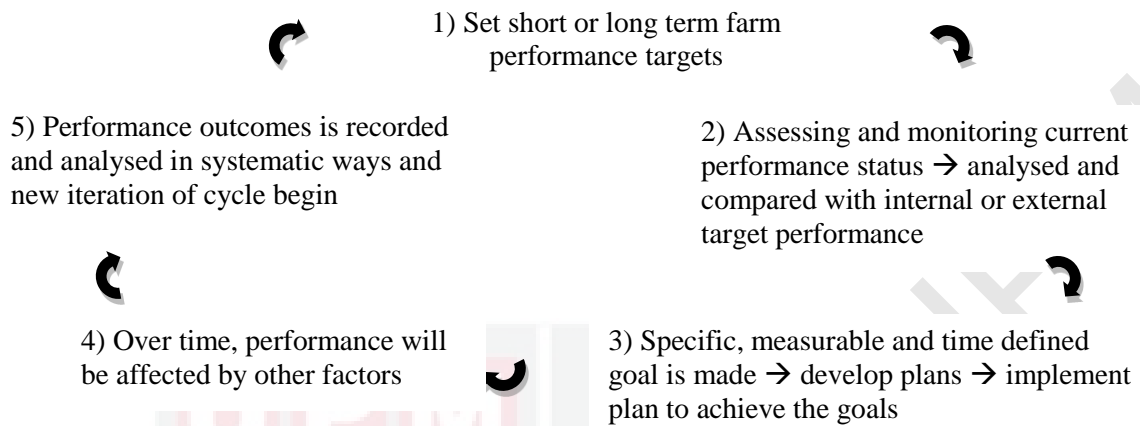
2.2 Evolution of Practices in Dairy Cattle Veterinary Medicine

According to (LeBlanc et al., 2006), disease prevention is considered as a broad spectrum approach which is no longer the sole responsibility of veterinarian. Furthermore, to execute health management and effective disease prevention strategies, the veterinarian must integrate a combination of nutrition, housing and whole farm management systems into recommendation of great farm management. Therefore, veterinarian evolving from task oriented treatment providers to advice oriented consultants. (Figure 1)

- Clinical disease → subclinical disease → health maintenance
- Treatment → prevention → advice
- Respond to emergency case → health management
- Animal health/ animal welfare → public health / food safety

Figure 1. A schematic representation of practices evolution in dairy cattle medicine over last 25 years (LeBlanc et al.,2006)

2.3 Herd Health Management Conceptual Cycle (LeBlanc et al.,2006)



2.4 Component of herd health program

The structure of herd health program is generally exclusive to each farm but is normally keyed to scheduled veterinarian visit with a combination of routine reproductive examination, review of selected herd performance record followed by decisions were made and actions were taken related to the specific herd management issues (Kahn, 2010).

According to Derks et al., 2014, herd health programs for dairy cattle had started since 1960s beginning with mastitis control (Bramley and Dodd,1984), followed by herd fertility schemes (Bramley and Dodd, 1984; Esslemont et al., 1985; Esslemont et al., 2001), disease prevention (De Kruif and Opsomer, 2004) and finally, quality control programs (Esslemont et al., 1985; Noordhuizen and Wentink, 2001; De Kruif and Opsomer, 2004).

There are several components of basic herd health plan for dairy cattle produced by the National Dairy Farm (USA) that is available online (http://www.nationaldairyfarm.com/site/default/files/Sample_Herd_Health_Plan).

pdf) such as biosecurity procedures, drug or animal health product management, calving and newborn calves management; cattle selling, receiving and culling procedure; feed and water quality assurance procedures; sick cow treatment procedures (mastitis, dystocia, milk fever, retained placenta, metritis, foot rot) and non-ambulatory animal care procedures.

Besides the components of stated HHP above, Kahn(2010) suggested a few more could be added into the component such as housing condition, parasite control, vaccination program, bull soundness examination and environmental management (waste disposal management and pest control).

2.5 Successful animal performance as effects of HHP

The concept of HHP which integrates herd health, animal welfare, public health and food quality assurance has shown to be effective in the past (Sol and Renkema, 1984; Hogeveen et al., 1992; Derks et al., 2012) and also at present. According to Derks et al., (2014) dairy cattle farmers in Netherlands who participated in veterinary herd health management (VHHM) were able to produce 336 kg of more milk per cow per year, lower age at first calving (less than 12 days), lower non return rate for cow (less than 3.34%), lower milk somatic cell count (8340 cells/mL) than farmers who did not participated in VHHM.

3.0 MATERIALS AND METHODS

3.1 Study Design

A preliminary survey in form of questionnaire was done in all 5 dairy cattle farms (n=5) among Ladang Angkat of FVM, UPM located in Selangor and Negeri Sembilan. The number of milking cow ranges from 5 to 70 heads with a mean of 9.4 heads. The questionnaire was designed using simple and common words in both Malay and English to the farmers understand and respond to the survey. The questionnaire comprised of 2 sections, section A (farm profile) and section B (farmer compliance on HHP). Section A was adapted from farm profile of Borang LT 1, Malaysian Good Agriculture Practice (MyGAP) evaluation form from Department of Veterinary Services which consisted the type of management, roof and flooring, milking facilities, animal performance, sales per month and medication. Section B consisted several questions concerning the farmer's knowledge, awareness and compliance on each component of herd health programs such as a) housing condition, b) feed and feeding management, c) deworming program, d) vaccination program, e) farm biosecurity, f) waste disposal management, g) fly, pest and odour control, h) milking management, i) reproductive management, j) calf management, k) cow management, l) animal identification, m) drug management and lastly n) disease monitoring program. Farmers were interviewed for section A whereas for section B farmers can answer by themselves or be interviewed by the student depending on the farmer's request. Visual examination was also done on the farms environment.

3.2 Data Collection

Questionnaire. 90% of the questionnaire was dichotomous (yes and no) questions. Farmers were asked to indicate whether they know what is HHP? Are they aware of the program existence? If they are aware, please tick which program they think should be included in HHP. Next, they were asked from where did they learn about HHP and are they practising HHP? If they are practising, are they practising the program properly? The next questions are detailed questions about each component as found in the HHP. These detail yes and no type of questions will determine the level of farmers' awareness and compliance on each program. Thus, those questions will be used to find association between farmers who's aware about HHP with their compliance on HHP. The few last questions were about agreement of the farmer on effect of practising HHP properly. The questionnaires were collected on the same day the questionnaires were given. (Sample of questionnaire is available in appendix)

3.3 Data Analysis

All the respondents' data was calculated in Microsoft Office Excel and analysed in IBM SPSS statistic version 20. The questions were designed where Yes means comply on HHP and No means do not comply on HHP.

1) Data on percentage of farmer compliance on each component in HHP:

- i. *Percentage Farmer 1 compliance for Component (a)*

$$= \frac{\text{number of yes}}{\text{total no of question in (a)}} \times 100 = F1 \%$$

ii. *Percentage of farmers (n=5) compliance on component (a)*

$$= \frac{F1+F2+F3+F4+F5}{500} \times 100$$

2) Data on percentage of farmer awareness on each component in HHP:

i. *Percentage of farmers awareness on component (a)*

$$= \frac{\text{number of yes}}{\text{number of farmers (n=5)}} \times 100$$

The percentage of farmers' awareness and compliance gained from Excel was inserted into SPSS with n=70 (14 components of HHP x 5 farmers = 70). Descriptive analysis was done after summarising both data into percentage of farmers' awareness and compliance. This is followed by association between farmers' awareness and compliance on each component in HHP was done begin with both were tested for normality (Shapiro Wilk) followed by test for correlation using Spearman's rho.

RESULTS

General information on farm management and herd population

All dairy cattle farms (n=5) involved in PLA were approached to join the study, of which 100% returned the questionnaire. Mean of total herd was 102 heads range from 30 heads to 160 heads and mean of milking cows was 29 cows with range from 5 cows to 70 cows. All farms practiced semi intensive system. 3 farms let their cattle graze on their own land whereas the other 2 farms did not (Table 1). There were several milking facilities available such as herringbone milking parlour, portable milking machine and hand milking. All farms practised natural mating but bulls were kept separated from the female herd.

Farm	Production system	Milking facilities	Total herd	Milking Cow	Non milking & heifer	Calf	Bull
A	Semi intensive	Herringbone milking parlor	30	17 (57%)	0	13 (43%)	0
B	Semi intensive	Portable milking machine	106	70 (66%)	30 (28%)	5 (5%)	1 (1%)
C	Semi intensive	Portable milking machine	160	35 (22%)	113 (71%)	10 (6%)	2 (1%)
D	Semi intensive	Hand milking	111	5 (4%)	85 (77%)	20 (18%)	1 (1%)
E	Semi intensive	Hand milking	104	20 (19%)	50 (48%)	30 (29%)	4 (4%)

Table 1: Data on farm management and herd population

Farmers' awareness about HHP

2 out of 5 farmers admitted that they know what HHP is, but only one can really define about HHP while the other one had just heard the terminology of HHP. The other 3 farmers never heard of the word of HHP. However, after interviewing

them and briefing them about HHP, 4 farmers did realise and were aware about HHP existence. All of them did practice HHP and they thought that they were practiced HHP properly. 4 out of 5 farmers did learn or knew about HHP from Program Ladang Angkat and by discussing with other fellow farmers while 3 out of 5 from courses offered by the Department of Veterinary Services.

Level of farmer compliance on 14 components of HHP

Figure 2 showed the level of farmer compliance percentage (n=5) on each component of HHP with mean \pm SD (61.2 ± 15.4) and standard error of 4.1. The lowest farmers compliance percentage was disease monitoring program followed by biosecurity, cow management, reproductive management, feed and feeding management, animal identification; fly, pest and odour control, milking management, calf management, housing condition, drug management, parasite control program, vaccination program and the highest was waste disposal management.

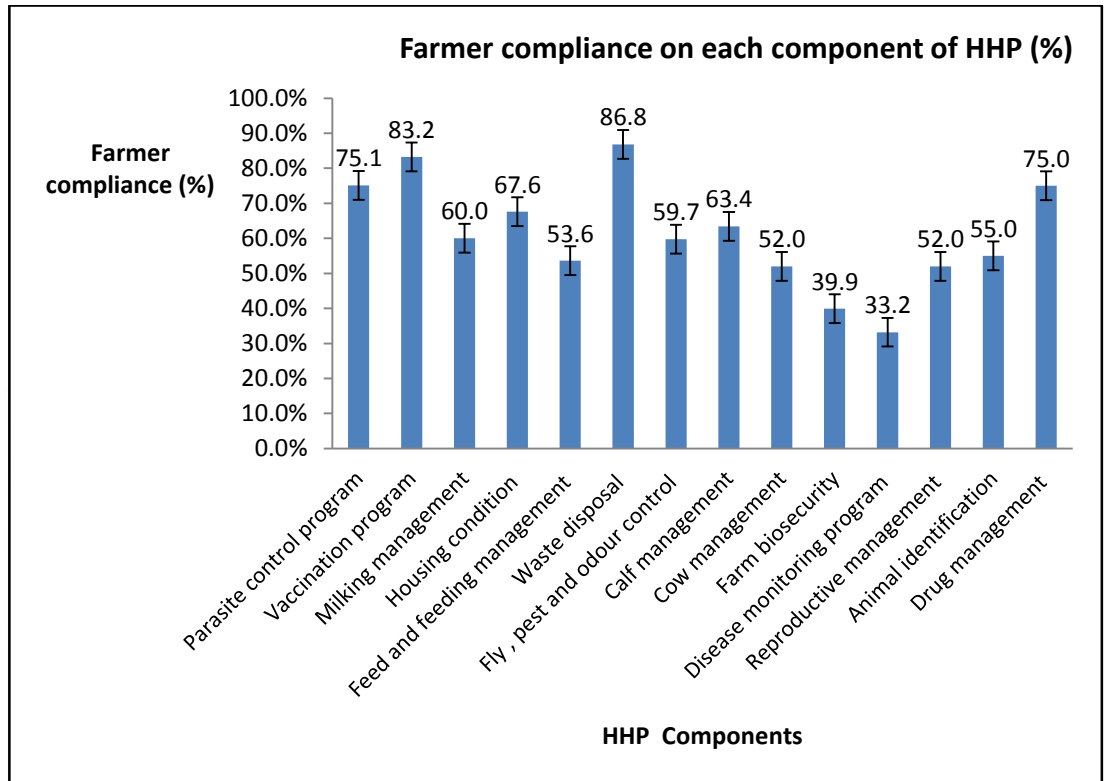


Figure 2: Bar chart of farmer compliance on each component of HHP (%)

Association between farmer awareness and compliance on 14 components in HHP

The dairy cattle farmers were aware but did not necessarily comply on each component in HHP according to mean \pm SD of farmers' awareness (72.86 ± 44.79) higher than farmers' compliance (61.18 ± 25.26). (Table 2).

Variables	N	Mean	SD	Maximum	Minimum	SE
Farmer awareness (%)	70	72.86	44.79	100.00	0.00	5.7825
Farmer compliance (%)	70	61.18	25.26	100.00	0.00	4.1108

Table 2: Descriptive statistic of farmer awareness and farmer compliance on 14 programs in HHP

The data of farmers' awareness was not normally distributed since $P (0.028) < \alpha (0.05)$ whereas data for farmer compliance was normally distributed since $P (0.910) > \alpha (0.05)$. Thus, Spearman's rho was chosen to find correlation between both variables since one of the variables was non parametric variable.

	Farmer compliance on HHP (%)	
Farmer awareness on HHP (%)	Correlation Coefficient (r)	0.245
	P value	0.042
	N	70

Table 3: Spearman's rho correlation with $H_0: p = 0$; $H_A: p \neq 0$

There was a significant low positive correlation between the farmers' awareness and farmers' compliance on 14 components of HHP, since $r = 0.245$ and $p = 0.042$ (Table 3). The data was low positive correlated based on Cohen, 1988 that recommends categorization of correlation effects according to magnitude of r (Table 4).

Correlation effect	Positive	Negative
Small	0.10 to 0.29	-0.29 to 0.10
Medium	0.30 to 0.49	-0.30 to 0.49
Large	0.50 to 1.00	-0.50 to 1.00

Table 4: Categorization of correlation effect

Based on Figure 3, blue and brown colour bars represent components with the farmers' awareness percentage more than farmers' compliance percentage whereas components such as waste disposal management, reproductive management, animal identification and drug management (blue and green colour bar) had farmers' compliance percentage more than farmers' awareness percentage which may due to presence of bias element in the questions asked.

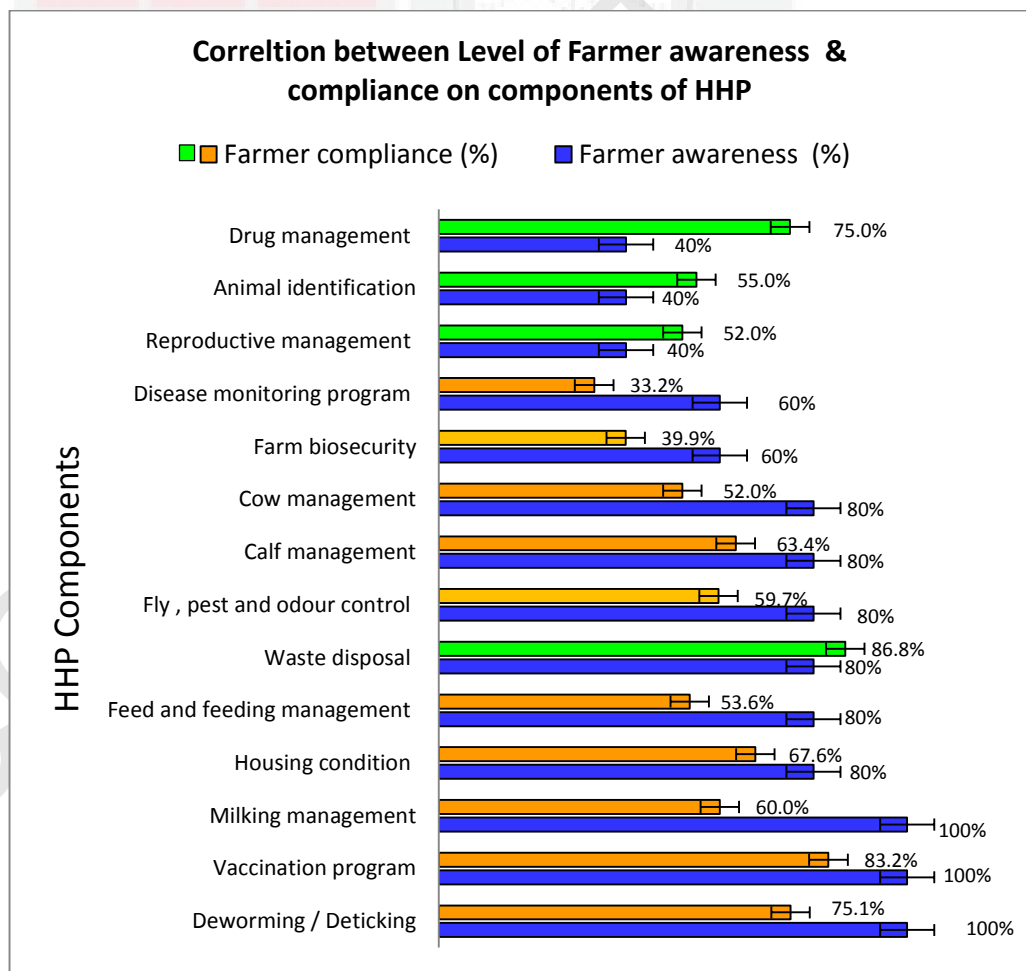


Figure 3: Bar chart of correlation between level of farmer awareness and compliance on component of HHP

DISCUSSION

In this study, 100% farmers responded to the questionnaire. This was expected as according to Dillman (2000), people who were interested in the topic were willing to answer the questionnaire.

The result in figure 3 showed four components in green and blue bars that had percentage of farmers' compliance which were more than awareness. These results indicated that there was some response bias. This was in line with a previous study done by Derks et al., (2014) where only 2 out of 10 variables had significantly different results whereas the other 8 variables were not due to bias response. This happened in this study due to the presence of some questions containing bias element where farmers definitely will answered yes to prevent from getting bad impression about their farm. Besides, 2 out of 5 questionnaires were not answered by the farmers themselves but were answered by their son and worker who only knew approximately 70% about the farm. They were not the one who attended seminar and practical training organised by FVM at Large Animal Unit, University Veterinary Hospital.

Factors affect farmers' compliance on Herd Health Program (HHP)

According to Moran (2013), while addressing key constrains to increase milk production in tropical Asia, there were several key constrains which indirectly will affect farmers' compliance on HHP. Chantalakhana (1999); Moran (2013) has categorised the limiting factors into institutional factors, such as lack of skill or training from extension services and socio-economic factors, such as the farmer's education and traditional beliefs . In this study, there were two contributing factors.

Firstly, not all farmers participating seminar (Hari Bersama Penternak) and practical training organised by FVM. Thus they have lost valuable lessons that could be applied to improve their farm productivity. The examples of lesson were theory and practical session in different use of anthelmintic for different worm and pasture management to reduce survivability of parasite to continue the life cycle. This would help farmers to reduce worm burden in their livestock. The next is the aspect of lack of training from extension services. There are a number of farm procedures that could be taught, for example procedures to prevent and control of mastitis in dairy farms and many other disease preventive measures.

The next factor affecting farmers' compliance on HHP was socio-economic factors such as farmer education, traditional beliefs Chantalakhana (1999); Moran (2013). Even though FVM had trained them either on the farm or during the seminar's practical, about lessons where applicable and within their economic capability, they still did not practice the lessons because they kept their traditional belief and experience to run the farm. They will be able to run the farm from their belief and experience but will not be able to save production cost and improve the farm productivity. Individual farmer's attitude and education also affect the acceptance of the lesson or advice given because some farmers come from non-animal background.

The cost of implementing HHP can also be an issue. Most of dairy cattle in Ladang Angkat tend to practice naming system instead of tagging them because they thought that tagging was more costly, without realising the importance of tagging which is a useful for record keeping where monitoring and analysis can be done later

on. Derks et al., (2014) stated that HHP will be appreciated by farmer if the cost of HHP do not exceed the total profit gained from a cow per year. The cost consists of milk production, heifer rearing, insemination and culling cost.

Lastly, it may be possible due to poor communication between veterinarian and farmers that efforts to discuss topic related to herd health management which are directly related to animal performance and farm productivity such as mastitis control, herd fertility program, disease prevention program and nutrition are not effectively done. (Derks et al., 2014). Besides, farm goals were not always clear to the veterinarian (Kristensen and Enevoldsen, 2008; Hall and Wapenaar, 2012; Derks et al., 2014) resulting in them giving poor and ineffective advice.

Recommendation for improvement of Ladang Angkat

Recommendations were done after detecting several components, with low farmers' compliance percentage as shown in Figure 2, such as disease monitoring and prevention program (33.2%), farm biosecurity (39.9%), reproductive program (52%) and feed and feeding management (53.6%).

For disease monitoring and prevention program, farmers were encouraged to participate with disease surveillance program of the Department of Veterinary Services Malaysia for routine endemic disease screening such as Brucellosis and Food and Mouth Disease. Clinician from Ambulatory Clinic, University Veterinary Hospital (UVH) should train farmers in developing skill to identify sick animal (Moran,2013) such as weak, reduce feed intake, isolate from herd and pale mucous membrane from conjunctiva, gum or vulva colour as both recommendation were

important for early disease detection which guarantee a better prognosis. Furthermore, farmers also need to reduce degree of disease exposure by improving farm hygiene in aspects of manure management and body discharge from sick animal to reduce morbidity and mortality lost due to disease (Kahn, 2010).

As for farm biosecurity, farmers were encouraged to implement the basic farm biosecurity measures such as to provide foot dip with disinfectant and farmers must follow correct instruction from the manufacturer in term of concentration and active period to prevent disease introduction or transmission between shed. To set up an isolation pen and isolate the sick animal from the healthy herd to prevent disease transmission between animal (Moran, 2013). Lastly routine wash, brush floor from weed and disinfect with lime powder are done to reduce survivability of pathogen in environment especially bacteria causing contagious mastitis such as *S. agalactiae* and *S. dysagalactiae* (Quirk et al., 2012)

For the reproductive program, since all the dairy farms practise natural mating with the bull being separated from the cow herd, farmers need to be trained on heat detection, such as secretion of vaginal discharge and stand to be mount to make sure the bull was released within 12-18h after end of estrus (ovulation time) to mate with the cow. With the aid of the veterinarian also, the bull need to undergo Breeding Soundness Examination (BSE) which consist of general health, reproductive health and hoof examination to improve reproductive performance of bull. The most important thing was for the farmers to keep reproductive record on heat expectancy chart/calendar, breeding chart (mating date) and individual cow health/reproductive card. This is to aid in pregnancy diagnosis that can be done by

farmers by checking the animals that fail to return to estrus after 21 days from mating date and to troubleshoot for any health/reproductive problem later (Hutchinson, 2013).

Next are recommendations for feeds and feeding management. Farmers must store feed properly in closed containers to prevent contamination from fungus producing aflatoxin and pest, such as rat transmitting leptospirosis. Farmers should plant enough grass to ensure continuous supply throughout the year and harvest fodder such as napier at correct growth age such as 4 to 6 weeks old, as younger napier contain low dry matter whereas older napier contain high fibre. Besides that, farmers need to optimize forage agronomy such as soil preparation using fertiliser, do soil quality check and control weed in pasture which cause competition in soil nutrient with planted forage. Good soils are able to provide forage and eventually animal that consume the forage with better nutrient content grow and perform better. Finally, do feed analysis on the feed ration given to animal to provide optimum nutrient requirements according to growth, pregnancy and lactation stage which would be able to reduce unnecessary amount of feed given to animal, thus able to reduce feed cost (Moran, 2013).

The most important recommendation is for the farmers to establish a record system. The system can help the veterinarian to collect and interpret data systematically, easily and rapidly. LeBlanc et al., (2006) stated that the objective of the record system extends beyond disease prevention, but the system nevertheless is an essential component of herd health management.

CONCLUSION

Farmers are aware but did not necessarily comply on HHP. There was a significant low positive correlation between farmer's awareness and farmer's compliance. It is due to lack of knowledge and awareness; constraints in finance; still kept their traditional belief and poor communication effectiveness between veterinarian and farmers. Therefore, they need help in the form of training and guidance via extension services to be given by institution such as Department of Veterinary Service and Faculty of Veterinary Medicine, Universiti Putra Malaysia.

RECOMMENDATION

In terms of questionnaire designing, include detailed question on the component of HHP to improve accuracy of compliance, prevent bias element in the question, choose appropriate type of questionnaire to improve analysis accuracy and lastly do trial on questionnaire before conducting the project.

For further improvement of Ladang Angkat program, survey should be done to compare between dairy cattle farms participating and non-participating in herd health program to show the true impact of HHP on farm productivity.

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APPENDICES

QUESTIONNAIRE FOR THE SURVEY OF FARMER COMPLIANCE ON HERD HEALTH PROGRAM

This study is intended to identify farmer compliance on proper herd health program practice in relationship with farm productivity and animal performance. This questionnaire will take about 20 minutes to complete. The information received from this survey is CONFIDENTIAL and will be used for research purpose only.

INSTRUCTION: Section A will be fill up by student , section B will be answered by farmer (interview by student)

SECTION A : FARM DETAILS

Herd owner/ company /organization:

Name of farm :

Address :

Phone number:

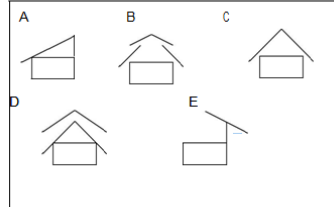
1. MANAGEMENT (please tick (/))

Herd	Open	
	Closed	
Rearing	Separate age group	
	Mix	
Feeding	Manual	
	Mechanised	
Drinkers	Trough	
	Drum	
	Automatic drinking bowl	
Ventilation	Fan	
	Evaporative colling	
Type	Stall feeding	
	Semi intensive	
	Extensive	
Feeding regime	Type of feed	Rate/day
	Calf pellet	_____ kg/calf
	DCP	_____ kg/milking cow
	others	_____ kg/cow

2. ROOF AND FLOORING

Concrete (Con)
 Concrete with rubber mat (CR)
 Compacted earth (CE)
 Attap (AT)
 Asbestos (AB)
 Aluminium (AL)
 Corrugated zinc (ZN)

ROOF ANGLE PITCH



3. MILKING FACILITIES (please tick (/))

EQUIPMENT/FACILITIES	Yes	No
Hand Milking		
Portable Milking Machine		
Pipelines Type		
Herringbone Type		
Refrigerated Farm Tank		
Ice bank and Plate Cooler		
Cold Room		
Immersion Coolers		
Hot Water System		
Others		

4. PERFORMANCE

Parameters	Unit
Calf Mortality Rate	%
Herd Mortality Rate	%
Average Market Weight - Male (Age _____ Days)	Kg
Age at First Breeding	Days
Pregnancy rate	%
Calving Rate	%
Calving Interval	Days
Conception Rate (at First AI)	%
Conception Rate (all Services)	%
Average Lactation Length	Days
Average Yield Per Lactation	Kg

5. SALES PER MONTH

Milk sales	Maximum volume (L) :	
	Minimum volume (L) :	at
	RM/L	
Animal sales	Numbers (average/ month) :	
	Animal type: (calf/ steer/ feed- lot dairy bull/ Culled cows)	

6. MEDICATION

i) Routine drugs normally used against stress/disease prevention including drugs used in feed and water					
Type of drug	Age at which administrated	Duration (in days)	Purpose for which used	Withdrawal period	Supplier

SECTION B : QUESTIONNAIRE

- Do you know what herd health program is? Yes No
- Are you aware of herd health program existence? Yes No
- If you are aware, please tick (/) programs included in herd health program:

Program	Yes	No
a) Housing condition (eg : roof, flooring, ventilation, sanitation)		
b) Feed and feeding management (feed storage, amount of feed required per animal)		
c) Deworming / Deticking		
d) Vaccination program		
e) Farm biosecurity		
f) Waste disposal (eg : dead animal/ manure)		
g) Fly , pest and odour control (eg: rat		
h) Milking management		
i) Reproductive management (eg: estrus synchronization, bull soundness examination		
j) Calf management		
k) Cow management		
l) Animal identification		
m) Drug management (record system, storage)		
n) Disease monitoring program (routine sampling for laboratory diagnosis)		

- Where do you learn about the herd health program (can tick (/) one only)

Sources	
Course offered by Department of veterinary service (DVS)	
Private veterinarian	
UPM Ladang angkat program	
Internet	
Other farmer	

- Are you practising herd health program? Yes No
- If yes, do you think that you are practising herd health program properly? Yes No

7. Please tick (/) which one did you practiced?

a. Housing condition (sanitation)		Yes	No
Is your farm located in a free disease area?			
Did you do any research/get consultation about the location before setting up your farm?			
Do you think that the cattle house is adequately ventilated?			
Do you know hot environment causes heat stress in cow thus reduces milk production?			
Do you think the floor is safe and not slippery for the cow?			
Do you provide beddings (eg: rubber mat) for your cattle?			
How many times do you wash the floor per day? (circle the answer)	1	2	3
How many times do you wash feed and drinking trough per month? Please state: _____			
b. Feed and feeding management		Yes	No
Do you store feed properly in closed container to prevent from any possible contamination such as pest or fungi?			
Do you make sure that your pasture/grass does not has access from outside ruminant animal?			
Do you know that harvesting grass at different growth stage contain different amount of nutrient?			
Are you aware that different growth stage / function of animal have different nutrient requirement?			
Did you give any feed supplement? (please tick (/)) : Mineral block () multivitamin injection () please state : _____			
Do you do: i) feed analysis on grass and/or pellet? Yes <input type="checkbox"/> No <input type="checkbox"/> ii) Soil quality? Yes <input type="checkbox"/> No <input type="checkbox"/>			
c. Parasite control program		Yes	No
i) deworming program			
Do you deworm your cattle?			
Who did the deworming? (Circle your answer) : yourself / your worker / vet / dvs			
Answer these questions below, If you or your worker did the deworming			
When did you start to deworm? (weeks old) (circle your answer) : 4 / 6 / 8 / 10 / 12 / 16 / 18 weeks			
How frequent did you deworm? (circle your answer) : depend on fecal egg count or worm burden / every 3 months / other: _____months			
Did you check the expiry date of the drugs before use?			
Did you make sure the dose and volume given is correct?			
Do you know that giving inadequate dose of dewormer can cause drug resistance?			
Do you know that alternate use of different dewormer can reduce drug resistance?			

ii) Deticking program		Yes	No	
Do you detick your cattle?				
Who does the deticking? (Circle your answer) : yourself / your worker / vet / dvs				
How frequent do you detick? (circle your answer) : every 3 month / depend on tick burden / other: _____				
d. Vaccination program		Yes	No	
Do you vaccinate your cattle?				
Who did the vaccination? (Circle your answer) : yourself / your worker / vet / dvs				
Do you know the vaccination protocol? (at what age to start vaccine and booster)				
e. Farm biosecurity		Yes	No	
Does your farm area (including pasture area) secured by fence?				
If yes, do you always check the fencing is in good and safe from outside animal?				
Do you emphasize on using uniform and/or gum boot everyday ?				
Do you have isolation pen in the farm?				
Do you isolate sick and new animal separately in different isolation pen?				
Please tick (/) which one do you use:				
Vehicle disinfection	Manual spray			
	Manual high pressure spray			
	Open wheel dip			
	Covered wheel dip			
	Covered wheel dip with spray			
Footbath to the Cattle house	Randomly place			
	Entrance to every house			
f. Waste disposal		Yes	No	
Do you dispose farm waste properly				
How do you dispose dead cattle?(please tick (/))				
Incinerator	Burn	Pit	Bury	Other

How do you dispose the cattle manure?(please tick (/))				
Just flush with water to push it out from cattle house	Flush with water and flow it into waste pond	Flush with water and let it flow into water stream or river	Collect and sell in wet form	Collect and sell in dried form
If the flushed water flow into river, do you treat the water first? Yes <input type="checkbox"/> No <input type="checkbox"/>				
Is there any water quality inspection done before the water flow into river? Yes <input type="checkbox"/> No <input type="checkbox"/>				
g. Fly, pest and odour control				

Does your farm have problem with (please tick (/) : fly <input type="checkbox"/> pest <input type="checkbox"/> odour <input type="checkbox"/>			
How do you control the problem? (please tick (/))			
	Chemical use	Other methods:	
Fly	Larva stage <input type="checkbox"/> Adultstage <input type="checkbox"/>		
Pest			
Odour			
h. Milking management (mastitis control program)		Yes	No
Do you make sure proper installation and function (suction pressure) of the milking machine?			
Do you make sure the milking area and cow's udder were cleaned before milking process?			
Do you perform California mastitis test (CMT) at least once a month before milking?			
How you wash the milking machine after milking? Hot water <input type="checkbox"/> Disinfect chemically <input type="checkbox"/>			

i. Reproductive management		Yes	No
Are you aware that keeping accurate reproductive record is very important to improve animal performance? (eg: calving rate, AI success rate)			
Do you observe for passage of placenta and remove it from calving area?			
Do you know that cow should not be allowed to eat placenta because it will not digested?			
Does your farm perform? estrus synchronization and artificial insemination () or natural mating ()			
Do you carry out bull soundness examination before buying a breeder bull?			
Do you perform routine hoof care to bull and cow to facilitate in mating process?			
Please tick (/) which one do you kept proper record			
1) Calving date		6) On heat date	
2) Calving difficulties		7) Mating date	
3) Retained placenta		8) Bull and cow used	
4) Abortion		9) Medication and hormonal treatment	
5) abnormal vaginal discharge			
j. Calf management		Yes	No
Do you make sure that pregnant cow which are almost due to calve get intensive monitoring for any assistant during calving?			
Do you make sure the cow lick the calf to dry?			
Do you make sure that the calf can stand up and get colostrum within 6 hours after born?			
Do you trim navel if it is longer than 6 cm and then dip the navel with tincture iodine?			
Do you tag or tattoo the calf within 1 week old?			
Please state the age range if you does not raise calf until adult but sell it : _____ until _____			
Do you practice FMD and HS vaccination after 3 months old followed by the			

booster?		
Did you properly record these: (please tick (/) which did you record		
Birth weight () Birthday () Tag no. () Bull tag no. () Cow tag no. () Breed () Sex ()		

k. Cow management	Yes	No
Do you gather all the cows which had just delivered together in a group to facilitate in examination for problems (eg: retained placenta, endometirits etc) in the future?		
Do you group cows according to function?(eg: on heat (waiting for service), pregnant, lactating, dry etc)		
Do you give extra supplement (eg: concentrates, molasses etc) to cows in late pregnancy?		
At which month of pregnancy do you dry the cows? _____ months		
How long do you dry the cows _____ months?		
l. Animal identification	Yes	No
Did you perform tagging to all new animals?		
Did you encounter problem of loss tag in animal?		
If yes, do you re-tag?		
Do you agree that identification assist in record keeping?		
m. Medication/Drug management (record system, storage)	Yes	No
Do you really know the indication, uses and storage of medication/drug that you kept?		
Do you get any consultation from licensed veterinarian first before buy and use it?		
Do you check the drug bottle/box for withdrawal period and expiry date?		
Do you have medication/drug recording system(date given, drug dosage, route, volume)		
n. Disease monitoring program	Yes	No
Is there any history of disease outbreak in your farm		
If yes, please state what and when? i) ii)		
Do you request for post mortem examination when there is death case?		
Do you request for routine disease monitoring?(eg: brusellosis, Johnes, blood parasitism)		
Does your farm ever request for routine antibiotic sensitivity test?		

8. Practising herd health program properly will :

	Yes	No
Increase farm productivity		
Increase farmer income		
Reduce treatment cost		
Reduce animal mortality		
Increase animal growth rate/body weight		
Increase milk production		
Reduce stress in animal		
Increase animal immunity		
Prevent disease introduction into farm		
Prevent disease transmission between animal in farm		
Prevent disease outbreak		
Prevent zoonotic disease transmitted from animal to human		

9. Are you willing to invest money for herd health program that guarantee long term profitability in future? Yes No

10. Do you prefer to avoid practicing herd health program and just spend money for treatment cost, disease control cost and mortality cost? Yes No

THANK YOU FOR YOUR CO-OPERATION IN THIS SURVEY.