FARMERS AND TRADERS WILLINGNESS TO USE AND PAY FOR ANIMAL IDENTIFICATION AND TRACEABILITY SYSTEM IN MALAYSIA

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ABSTRACT. Traceability system for livestock is an important infrastructure necessary to monitor animal health, animal disease emergencies and quality assurance. The aim of this study was to evaluate farmer and trader willingness to use and pay for an animal identification and traceability system in Peninsular Malaysia. Data was obtained from a questionnaire that was completed by 543 farmers and traders from the 10 states in the peninsula. Our results show that up to 54% respondents were willing to use and pay for an animal identification and traceability system. Gender and the length of experience of farmers and traders were factors significantly associated with the outcome of this study. Female farmers and traders were less willing to use and pay for an animal identification and traceability system while farmers and traders with more experience in the cattle industry were significantly more likely to provide a favourable response.

***Keywords*:** cattle, willingness, animal identification, traceability system, Malaysia

INTRODUCTION

The World Organisation for Animal Health (OIE) defines animal traceability as the ability to follow an animal or group of animals for all stages of its life. The purpose of traceability systems for livestock include monitoring animal health (disease surveillance and notification, vaccination programmes and animal movement controls), public health (surveillance and control of zoonotic diseases and food safety), management of emergencies (disease outbreaks and food safety incidents), trade (support for inspection and certification) and animal husbandry (animal performance and genetic data) (OIE, 2014). A livestock traceability system comprises of elements of animal identification, premises registration and animal movement tracing (USDA, 2006). There are several types of animal identification which includes ear tags (electronic or non-electronic), neck chains, branding (freeze or hot-iron), tattoo, nose print and paint mark (Neary & Yager, 2002).

In Malaysia, a system of livestock traceability has been employed since 2009

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as part of the national aspiration to achieve the status of being Foot-and-mouth disease (FMD) free with vaccination (Salina & Azmie, 2013). The livestock identification at present includes ear tags (electronic and non-electronic), rumen bolus and freeze branding. Before 2009, the common type of identification includes non-electronic ear tags, hot branding and tattooing. Since 2009, all imported cattle must be identified with radio frequency identification (RFID) tags (Azmie *et al.,* 2010) and all cattle must have either a visual ear tag or RFID ear tag to move both inter- and intra-state (Azmie & Salina, 2009 and Azmie & Salina, 2011). These identification system offer numerous advantages and are recommended because they provide a unique means of identifying individual animals, they are easy to apply and are relatively inexpensive (Hanton & Leach, 1981). The use of RFID among local cattle is limited as it is relatively new. Currently, farmers with their cattle under the FMD vaccination control programme run by the Department of Veterinary Services Malaysia (DVS) were among the first to receive RFID tags for free. However, cattle traders have to bear the cost of tags for animals they import. In future, there is a possibility that the government would not subsidise the tags anymore. Therefore, the farmers might have to bear the tag cost by their own.

The reception of farmers and traders to the new concept of traceability system has not been evaluated. The aim of this study was to assess the willingness of farmers and traders to both use and pay for an animal identification and traceability system in Malaysia.

MATERIALS AND METHODS

Study design and area

A cross-sectional study was carried out to generate a descriptive information on the willingness to use and pay for animal identification and traceability system among cattle farmers and traders. The farmers and traders were identified via the state and local veterinary offices and were contacted to be interviewed for the purpose of the study.

This study was conducted in 11 states in Peninsular Malaysia which includes Johor, Melaka, Negeri Sembilan, Selangor, Perak, Kedah, Penang, Perlis, Kelantan, Terengganu and Pahang between March 2014 and March 2015.

Data collection

A questionnaire was designed to assess farmers and traders' willingness to use and pay for an animal identification and traceability system. It also collected information on the socio-demography and farming background of the respondents. The items were written in Malay and pre-tested on 12 individuals before being administered to the respondents.

The questionnaire was distributed to the district veterinary offices through the Head of Veterinary Health Division in 11 states in Peninsular Malaysia. However only ten states agreed to collaborate where a total of 551 respondents were interviewed face-to-face. The respondents were selected randomly among farmers

and traders applying for movement or slaughter permits at the state and district veterinary offices or during planned herd health visits.

Data analysis

Data from 543 completed questionnaires were entered and analysed using SPSS version 20 (IBM Corporation, 2011). A Likert scale of 1 to 5 was used to indicate the level of agreement or disagreement of the respondent to a series of questions related to the usefulness and cost of a traceability system. In the remainder of this paper, we use the term 'outcome positive' to refer to the situation where a respondent indicated that they would be in favour of using and paying for a traceability system.

Chi-square analysis was used to determine the association between the socio-demographic and farming background of the farmers and traders, and a respondent being outcome positive. Chi-square or univariable logistic regression (when variable have more than two levels) was used to evaluate the strength of association between socio-demographic and farming background with the probability of being outcome positive.

RESULTS

Socio-demographics and farming background

A total of 830 questionnaires distributed in the 11 states in Peninsular Malaysia. 551 questionnaires (66%) were returned. Eight incomplete questionnaires were removed and the rest were analysed. A total of 543 respondents who participated in this study completed the questionnaires, of which, 90% were males and 10% were females. Most of them (48%) were 41-60 years of age. Based on the level of education, 69% have secondary education or higher. Almost three quarters (65%) of respondents were primary cattle producers and 27% were both cattle farmers and traders. More than one quarter (34%) have been involved in the cattle industry for 5-10 years, another 21% were new to the industry.

More than half (58%) of respondents have had experience rearing or trading anywhere between 11 and 100 head of cattle at any one time. In terms of management systems, the semi-intensive husbandry system predominated followed by extensive and intensive or feedlot systems (38%, 28%, and 24%, respectively). Only 58% of respondents reported that they had attended a course, received training or attended a seminar related to cattle farming.

Willingness to use and pay for animal identification and traceability system

Summary details of responses to specific questions about an animal identification and traceability system are provided in Table 1. The majority of respondents, 79.4% and 79.9% agreed and strongly agreed that traceability system should be continued and improved, respectively. Most (84%) were willing to follow the permit application procedures to move their cattle. Only 71% felt that the movement and slaughter permit fees was reasonable. A rather large proportion of respondents were reluctant

to pay for cattle identification (43%) even though many (74%) were willing to pay for a movement and slaughter permit. Overall, 74% of respondents were willing to use and pay for the animal identification and traceability system.

The association between respondent demographic characteristics and the odds of being outcome positive are reported in Table 2. Of all the respondent demographic and characteristic variables, only gender and length of experience in the cattle industry were significant at alpha level of 0.05. Females were significantly less likely to be willing to pay and use the cattle identification and traceability system while more experienced farmers and traders were more likely to respond favourably.

DISCUSSION

More than half of the respondents (54%) responded favourably to the idea of using and paying for an animal identification and traceability system in Malaysia. Overall, the proportion of farmers-traders who indicated that they were in favour of using and paying for an animal traceability system was slightly higher. This group of farmers and traders appear to appreciate the electronic traceability system as it is more efficient and user friendly compared to the previous traceability.

The respondents who were not favourable of the traceability system might not have adequate knowledge on the importance of the system. This was reflected by the high percentage of the

Table 1. Responses of respondents with regards to their willingness to use and pay for animal identification and traceability system

Statement	Strongly disagree or disagree *n* (%)	Not sure *n* (%)	Agree and strongly agree *n* (%)
Traceability system should be continued	20 (3.7)	92 (16.9)	431 (79.4)
Traceability system should be improved	22 (4.1)	87 (16.0)	434 (79.9)
I'm willing to pay for my cattle identification	100 (18.4)	136 (25.1)	307 (56.5)
I will follow the permit application procedure when I want to move my cattle	30 (5.5)	57 (10.5)	456 (84.0)
I'm willing to pay for movement and slaughter permit	62 (11.4)	81 (14.9)	400 (73.7)
The movement and slaughter permit fees was reasonable	64 (11.8)	95 (17.5)	384 (70.7)

Table 2. Univariable logistic regression analysis of factors affecting the willingness to use and pay for animal identification and traceability system

Variables	Good *n* (%)	Poor *n* (%)	Total	OR [a]	95% CI [b]	*p*-value
Gender:						
Male	272 (55.6)	217 (44.4)	489	1	reference	-
Female	19 (35.2)	35 (64.8)	54	0.43	0.24, 0.78	0.005
Age (years):						
20-40	126 (56.2)	98 (43.8)	224	1	reference	-
41-60	131 (49.8)	132 (50.2)	263	0.77	0.54, 1.10	0.156
61 and above	34 (60.7)	22 (39.3)	56	1.20	0.66, 2.19	0.546
Level of education:						
No formal education	10 (37.0)	17 (63.0)	27	1	reference	-
Primary	80 (55.9)	63 (44.1)	143	2.16	0.93, 5.04	0.075
Secondary	171 (53.8)	147 (46.2)	318	1.98	0.88, 4.45	0.100
Tertiary	30 (54.5)	25 (45.5)	55	2.04	0.79, 5.25	0.139
Respondent type:						
Farmer only	183 (51.8)	170 (48.2)	353	1	reference	-
Trader only	26 (57.8)	19 (42.2)	45	1.27	0.68, 2.38	0.453
Both (farmer and trader)	82 (56.6)	63 (43.4)	145	1.21	0.82, 1.78	0.339
Length in cattle industry (years):						
Less than 5	48 (42.5)	65 (57.5)	113	1	reference	-
5-10	98 (52.4)	89 (47.6)	187	1.49	0.93, 2.39	0.096
11-15	50 (50.5)	49 (49.5)	99	1.38	0.80, 2.38	0.243
16-20	39 (61.9)	24 (38.1)	63	2.20	1.17, 4.13	0.014
21 and above	56 (69.1)	25 (30.9)	81	3.03	1.66, 5.53	0.000
Number of cattle rear / trade (head):						
Less than 10	72 (49.3)	74 (50.7)	146	1	reference	-
11-100	175 (55.4)	141 (44.6)	316	1.28	0.86, 1.89	0.225
101-1000	35 (57.4)	26 (42.6)	61	1.38	0.76, 2.53	0.291
1001 and above	9 (45.0)	11 (55.0)	20	0.84	0.33, 2.15	0.718
Type of husbandry system practiced:						
Extensive	74 (48.1)	80 (51.9)	154	1	reference	-
Semi-intensive	110 (52.9)	98 (47.1)	208	1.21	0.80, 1.84	0.363
Intensive / feedlot	75 (57.7)	55 (42.3)	130	1.47	0.92, 2.36	0.106
Integration	32 (62.7)	19 (37.3)	51	1.82	0.95, 3.49	0.071
Attend course / training:						
Yes	178 (56.5)	137 (43.5)	315	1	reference	-
No	113 (49.6)	115 (50.4)	228	0.76	0.54, 1.07	0.109

[a] OR: Odds ratio

[b] CI: Confidence interval

population sampled in this survey who had never been exposed to any training related to cattle farming. Knowledge had been found in other studies to positively or negatively influence opinions and views such as observed in the study of Adesokan & Ocheja (2014) who reported that poor knowledge and practices of traceability are a threat for sustainable livestock production in Nigeria.

A relatively large percentage of respondents were unwilling to pay for the cattle identification. We speculate that this is because tags have been provided to them for free by the government via the FMD vaccination control programme. Therefore, there has not been a perceived need for farmers to purchase cattle identification tags and paying for identification may be thought of as an additional unnecessary cost.

It is hard to explain why female farmers or traders were less willing to use and pay for the new tool of animal identification and traceability system. The comparatively smaller female respondents interviewed could be one of the reason why a difference was observed. However, women have been found to be less positively disposed towards technology than men (Lockie *et al*., 2005) and less likely to be willing to pay for agricultural extension services such as seen in Nigeria (Oladele, 2008).

Those who have spent more time in the cattle industry were more likely to be outcome positive. Our finding agrees with the report of Oladele (2008) who found that farmers with longer experience in the agricultural sector were more willing to pay for extension services in Nigeria.

This study paves the way forward for a successful cost sharing for livestock upgrading programme between farmers and government agencies and for the government to make a decision on the funding cost of the animal identification in the future. Awareness on the importance of animal traceability system is vital to improve farmer's compliance and cooperation. Therefore, education about the new concept of traceability system should be emphasized and conducted at a regular basis in all states and districts. A priority should be given to the new farmers or traders especially women farmers and traders.

CONCLUSIONS

This study found that on average, more than half (54%) of farmers and traders were willing to use and pay for the new tool of animal identification and traceability system. A smaller percentage (46%) was not sure and responded negatively. Females were significantly associated with negative response to the outcome of this study. Farmers and traders with more experience in the cattle industry were more likely to be indicated that they were willing to pay and use a system. The information gathered from this study can help the government to better manage limited resources and improve the implementation process of the traceability system. Education about the new system in a form of scheduled short courses or training should be conducted

in a regular basis in all states and priority to the new farmers or traders to increase their level of understanding about the significance of the new system. New approaches of training such as e-learning, chain messages using mobile applications or hands-on awareness programme should be taken into consideration as most of the farmers and traders have at least one mobile phone. Meeting with farmers and traders should be held at least yearly to share new knowledge, technologies and listen to their problems and suggestions.

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