



Farmers' Perception towards Chemical Castration Method in Piglets

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ABSTRACT

The present study has been carried out in Thoubal and Kakching districts of Manipur. The study disclosed farmers' perception on selecting castration methods in piglets among various methods. Chemical castration has been preferred by majority (85 %) of the respondents. The study also revealed that chemical castration can be an alternative method to regular surgical castration because of its inexpensive, less time consuming, easy to perform, increase the body weight and feed conversion efficiency post castration.

Key Words: Castration, Chemical, Farmer, Perception,

INTRODUCTION

Castration of male piglets intended for meat production is a routine practice in the various part of the world. Piglets are castrated during the first weeks of life in order to reduce the boar taint of the meat (USDA, 2001). Surgical castration by the farmers without the use of anaesthesia is still predominant practice most places but this practice is now questioned in many countries due to animal welfare concerns (EFSA, 2004). With increasing animal welfare concerns in the swine industry worldwide, the pursuit for inexpensive and effective alternatives for surgical castration of piglets is now a priority (USDA, 2001). Although, surgical castration is favoured by most swine producers, it can also alleviate potential behavioural problems associated with raising intact males. But this practice has come under major scrutiny in the past 20 years as animal welfare concerns are being raised regarding the pain associated with surgical removal of the testes. De Roest *et al* (2009) stated that within the EU surgical castration will unlikely to be tenable in the future.

Many researcher have been published various study on comparison of pros and cons of the alternatives of the castration methods (Tuytens *et al*, 2012). Recently, studies have also been done on stockholder attitudes towards alternatives of the castration with regards to animal welfare (Von Borell *et al*, 2009), meat quality (Lundstrom *et al*, 2009) and economic classification (De Roest *et al*, 2009). This is matter of considerable importance as the piggery farmers generally demands insistent high quality meat (Squires, 2006). It is also mentioned by Babol *et al* (2004) and Zamaratskaia *et al* (2004) that slaughtering of pig at an early age may reduce the boar taint as the expression of boar taint is association with sexual maturity.

Chemical castration of pigs is an alternative to the regular surgical castration procedure that has historically been used to prevent boar taint in the resultant pork products (USDA, 2001). Chemical castration consists of injecting chemicals (such as lactic acid or zinc salts) into the testicles, causing destruction of testicular tissue (FAWEC, 2013). The advantages which are claimed for the use of

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acids and salts are: easy to administer, safe for the animals and people who administer them, not expensive, produce no haemorrhage and only little pain, and have little side-effects (EFSA, 2004). Although many studies were made regarding farmers acceptability of castration methods, still there is very much to investigate whether the existing pattern of castration of pig is acceptable or not. The present study aims to investigate and study the farmers' perception towards chemical castration in piglets.

MATERIALS AND METHODS

Sample Selection and data collection

The present work is a first-hand study on the farmers' perception towards chemical castration method for piglets. Thoubal and Kakching district have been selected purposively. Altogether, 120 sample households were randomly selected for the study, 60 households from each district. A quantitative study was conducted through focus group discussion to carry out in-depth study. The discussion was done separately for the two selected village and conclusion were made based on the experience from the focus group discussion. A quantitative based study were also done through primary data which were collected using well-structured interview scheduled through field visit and personal interview method.

Reliability of the Measurement Items for Internal Consistency

A profound list of relevant variables with their measurement items was developed based on literature review and discussion among the scientist and experts in the field. This list included items reflecting farmers' perception to pig castration method, location specific extension program for improving production thereby enhancing double income. To elicit responses on frequency and extent, the face validity of the selected items was ensured from reliability analysis during pre- testing and after data collection. Cronbach's Alpha value was

calculated and compared with the range to examine consistent with the recommended value of greater than or equal to 0.7 (Henseler *et al*, 2009; Hair *et al*, 2012), indicating their validity and reliability. The formula for Cronbach's alpha is as follows:

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k is the number of items taken up for study; refer to the item difficulty is the proportion of examinees who answered item i correctly; and is the sample variance for the total score. Cronbach's Alpha value ranges from 0 to 1.00, with values close to 1.00 indicating high consistency. Professionally developed high-stakes standardized tests should have internal consistency coefficients of at least 0.90. Lower-stakes standardized tests should have internal consistencies of at least 0.70 or higher (Wells and Wollack, 2003). Cronbach's alpha value of more than 0.7 is regarded as reliable and a valid one (Henseler *et al*, 2009; Hair *et al*, 2012).

Chemical castration in piglets

Chemical castration is the way of removing testes in piglet using chemical solution. The average age of Piglet for effective castration is usually when the pig attains 40-45 d old to 3 m. Pig which age less than 3 m requires 4ml (2ml per testes) of solution per castration while the quantity of solution require for castration of pig more than 3 months will depend on their body weight.

Materials required for 100 ml solution

Glacial acetic acid	17ml
Distilled water	83ml
Potassium permanganate	0.25g

RESULTS AND DISCUSSION

Socio-Economic Characteristics

The socio- economic characteristics of the respondent is considered as a means for assessing the basic background and wellbeing of the household. In this study, characteristics such as age, education, annual household income, family

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Table 1. Socio- economic characteristic of the respondents.

Sr. No.	Characteristics	Frequency	Percentage (%)
	Age category		
	Less 30 yr	10	8.33
	30-55 yr	98	81.67
	More 55yr	12	10.00
	Education qualification		
	Primary	10	8.33
	Middle school	22	18.33
	High school	55	45.83
	Intermediate level	13	10.84
	Graduate	20	16.67
	Family Size		
	1 to 4	55	45.83
	5 to 6	48	40.00
	7 to 10	17	14.17
	Annual household income		
	<40000	12	10.00
	40000 to 100000	63	52.50
	>100000	45	37.50
	Types of farmer		
	Marginal (<1 ha)	102	85.00
	Small farmer (1-2 ha)	13	10.83
	Medium (4-10 ha) & Large (>10 ha)	5	4.17

size and type of farmer based on land holding have been studied (Table 1). It was found that majority of the respondent *i.e.*, 81.67 per cent belong to the age group of 30 to 55 yr old, followed by age group of more than 55 yr of age constituting 10 per cent and the remaining 8.33 per cent in the age group which is less than 30 yr. It shows that middle age people tend to be more aware about castration and able to identify what is more advantageous method of castration. While examining education level of the respondent farmers, it was revealed that almost all the farmers taken in the study were literate. About 46 per cent (45.83 %) of the farmers

have completed high school followed by middle school standard (18.33 %) while 16.67 per cent were graduate. This shows that farmers have good education level which help in choosing method of castration which make them realised the felt need about the animal welfare and economy. Maximum household of the study have family size of 1 to 4 members which is followed by households with 5 to 6 members constituting 45.83 per cent and 48 per cent respectively while remaining only 17 households have family size 7 members and above.

While studying the income of respondent household, it was revealed that majority of the respondents (52.50 %) have average income between Rs. 40,000 to 1 lakh per annum, while 37.50 per cent of the household have income above 1 lakh and 10 per cent of the respondents have income less than Rs. 40,000/-. Land holding profile of the respondent revealed that marginal farmers with less than 1 ha area constitute 85 per cent, small farmers with land holding 1 to 2 ha constitute 10.83 per cent and only 5 farmers of the study belonged to the medium & large category.

Reliability of the Measurement Items

Reliability measurement of the 7 parameters for the factors of the respondents' perception towards CC being developed for the study was analysed using Cronbach's alpha value (Table 2). For the present study Cronbach's alpha value was found to be 0.631 which shows that reliability coefficient is high and the score on that test can be used to draw conclusions about farmer's perception towards chemical castration in piglets.

Amount of Variation in relationship between dependent variable and independent variables

The Pseudo-R squares *viz.*, Cox and Snell R^2 and the Nagelkerke R^2 values of 0.668 and 0.948, as apparent from Table 2 disclosed that between 66.80 and 94.80 percent of the variability in dependent variable which is farmers' acceptability is explained by the set of independent variables used in the model.

Table 2. The Pseudo-R squares

Cox and Snell	Nagelkerke
.668	.948

Perception of farmers' in choosing castration methods in piglets

Acceptability of the Castration

The farmers were asked their opinion and made to choose among the selected castration method or no castration to generate their perception of castration method. From the figure 1, it was revealed that majority of the respondents (85.00 %) were choosing chemical castration as the best option among the given method of castration. This might be due to their easiness to administer, safe for the animals and people who administer them, inexpensive, produce no haemorrhage, little pain, and have little side-effects. About 10.83 per cent of the respondents choose surgical castration and these farmers category belonged to the aged group more than 55 years old, this might be because of their persistence to the old technology.

Factors influencing the choosing of chemical castration

The likelihood ratio test (Table 3) Concluded that factors such as age of the respondents and labour intensive of the CC and economy of CC

have been found significant at 1% with respect to high perception of CC. Further, factors like time efficiency and types of farmers' base on their land holding categorize in the study found to be significant at 5% with respect to high perception of CC. Other factors such as education qualification of the farmers and income has no effect or null effect to the dependent variable i.e. high perception of CC.

CONCLUSION

Majority of the farmers were choosing chemical castration as an alternative to surgical castration because of its inexpensive, less time consuming, easy to perform, increase the body weight and feed conversion efficiency post castration. Further, farmers also accepted the quality of meat from the CC were higher apropos to meat quality from surgical castration pigs. Two castration methods and no castration option were given to the farmers to choose their best option for castration in piglets. But the latter *two i.e.*, surgical castration and no castration were strongly rejected by the farmer. The reason of this rejection might be due to these practices were making additional cost in terms of higher expenses and labour intensive condition and more time consuming for the surgical castration. More over farmers were also reluctant to no castration practices as it produces boar taint leading to deteriorate in the quality of the meat produced.

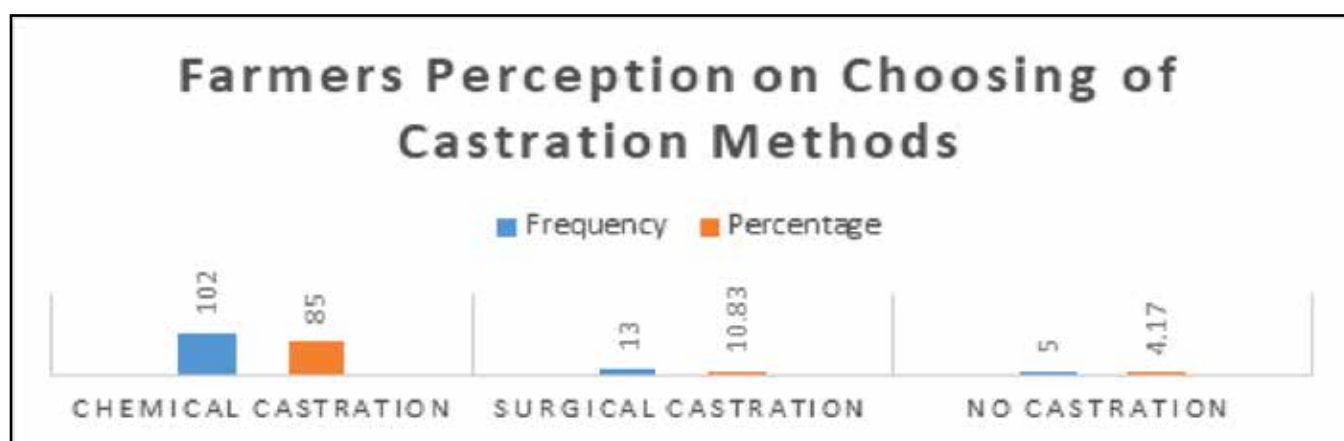


Figure 1. Graph on Farmers Perception on Choosing of castration methods

Table 3. Factors influencing the choosing of chemical castration.

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	56.007	.001	0	.
Age	84.001***	18.003	4	.001
Types of Farmer	76.170**	14.702	6	.023
Income	64.325	8.217	4	.084
Labour efficiency of CC	80.299***	16.292	4	.001
Education Qualification	55.343	7.337	4	.119
Time efficiency	44.821**	9.635	4	.047
Economy of CC	75.527***	15.588	6	.005

(***Sig. @ p <0.01, **Sig. @ p <0.05)

The study also revealed the factors for majority farmers for higher acceptability of CC. Factors such as age, farmer types, labour efficiency of CC, time efficiency and economy of the Chemical castration. Regarding the present study, the farmers' perception is strongly related with public concerns of ethical and moral consideration such as animal welfare concerns and social acceptability (Vanhonacker *et al*, 2009). This also supports their rejection of other two castration methods of bearing any costs borne by the consumer, thus increased farmers' willingness to adopt the CC as an alternative to surgical castration. Based on the above findings, farmers will drive for CC and show reluctant to go for surgical castration in piglets. Further, more number of awareness and demonstration/training programmes should be conducted in order to make people more aware about the alternatives to surgical castration method. The line departments, ICAR, CAU, SAUs, KVKs etc. should encourage and guide farmers for selecting best alternative castration methods which will be widely acceptable by the public as livestock sector including piggery is also one of the main income generating activities in North-East India states like Manipur.

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