Poster Presentation (PF-7)

Pre Slaughter Stunning of Ruminant Slaughter Based on MUI HAS 23103 2012, MS 1500 2009 and SNI 99003 2018

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INTRODUCTION

The debate about the use of pre slaughter stunning (PSS) in halal slaughter is still an interesting topic to discuss due to the difficulties to determine the stunned animal are unconscious or dead. Indonesia and Malaysia as a country with majority Muslim population have recognized non-penetrative PSS (NPPSS) as a method in halal slaughter. Indonesian Council of Ulama (MUI) issued the Halal Assurance System (HAS 23103 2012)[1] as guidelines for animal slaughter process, while Department of Standard Malaysia issued Malaysian Standard (MS) 1500 2009[2], which regulate Halal Food-Production, preparation Handling and Storage-General Guidelines. Recently, the Indonesian National Standardization Body issued Indonesia's National Standard for ruminant halal slaughter (SNI 99003 2018) [3]. This article will discuss mechanical NPPSS based on these three guidelines in animal welfare and halal perspective

MATERIALS AND METHODS

This article is written based on the identification of the critical point of the animal welfare and halal overview in the MUI guidelines 23103 2012[1], MS 1500 2009[2] and SNI 99003 2018[3]. The critical points identified were analyzed and compared with the literature

DISCUSSION

NPPSS is a method that allowed on all guidelines: HAS 23103; MS 1500 2009; and SNI 99003 2018. It has been detailed in HAS 20103 and SNI 99003 2018, while MS 1500 2009 is still a general guide and state detailed in Malaysian Protocol for the Halal Meat and Poultry Productions. However, there are several differences in implementation guidelines and acceptability criteria.

Animal Welfare Overview

Based on animal welfare viewpoint, implementation of NPPSS is to induce unconsciousness so that animals are easily handled and do not suffer during the slaughter process. There are several critical point related to animal welfare; type of stunner to provide enough power, accuracy of shooting placement, and interval stun to bleed. HAS 23103 and SNI 99003 2018 allow the use of stunner-powered cartridges and pneumatic stunner, while MS 1500 2009 only allows the use of pneumatic stunner. According to variation in cattle size and breed, the use of a stunner powered cartridge requires a specific type of cartridge. Cartridge can be identified by size, by color and code. Nowadays, many slaughterhouses do not use cartridges powered stunner cartridge and switched to pneumatic stunner whose strength is more easily adjusted.

Correct position of shooting placement is a key element that determines the effective NPPSS. The head of stunner must be placed at the right angles of skull directing it to the center of brain. There are different shooting landmark to determine shooting placement between HAS 23103; MS 1500 2009 and SNI 99003 2018. According to HAS 23103 shooting placement must be on the point of intersection of lines drawn from the eye to the base of opposite horn, whereas according to MS 1500 2009, shooting placement must be at the point intersection between medial corners of the eyes and the base of the opposite base of ears. This position was adapted from the guidelines of HSA (2013) [4] and Grandin (2014) [5]. According to SNI 99003 2018, the shooting placement must be on 2 cm above the point of intersection of lines drawn from the eye to the base of opposite horn, that adopted from Gilliam *et al* (2016) [6]. Since the shape of the head of the different breed of cattle is known to affect the position of the brain, the shooting placement guidelines must be evaluated. According to Gilliam *et al* (2016) [6], *Bos indicus* has brain position more caudally than *Bos taurus*, so that the shooting placement according to SNI 99003 2018 is more appropriate for *Bos indicus*.

The interval time between stun and

slaughter is critical and the animal must bleed within 30 second to avoid the cattle regain of conscious or even die before slaughter. Although there is no significant differences of total blood loss volume between stunned and non-stunned animal, delayed bleeding significantly reduce total blood loss [7]. Its need restraining boxes that equipped with easy operate exit panel.

Halal Overview

The main requirement of halal is the animal shall be alive or be considered alive (*hayat al-mustaqirrah*) at the time of slaughter. All guidelines require reversible stunning, so that, NPPSS shall not kill or cause permanent physical injury (especially on central nervous system (HAS 23103) (Table1). This requirement is very strict or even almost impossible to practice in the field.

Table 1 Acceptability broken skull criteria

HAS 23103		
Level	Description	Status
1	No damage in skull	Accepted
2	Bruised of skull, without crack of skull	Accepted
3	Bruised and crack of bone skull but not shifted	Not Accepted
4	Bruised and crack of bone skull. The fractured bone shifted but did not penetrate the skull/brain	Not Accepted
5	Bruised and crack of bone skull. The fractured bone shifted penetrates into the skull/brain. There is a hole in the skull	Not Accepted
MS 1500 2009		
Level	Description	Status
1	No Visible Damage	Acceptable
2	Indentation, No Cracking	Acceptable
3	Indentation with cracking, but no displacement	Non-Acceptable
4	Indentation with cracking and displacement of bone no more than its own thickness	Non-Acceptable
5	Indentation with cracking and displacement of bone more than its own thickness	Non-Acceptable
6	Indentation, cracking and brain exposure	Non-Acceptable
SNI 99003 2018		
Level	Description	Status
1	Head of stunner and broken skull did not penetrate into brain (considered as non-penetrative stunning)	Accepted
2	Head of stunner and broken skull penetrates into brain, there is a hole into brain cavity (considered as penetrative stunning)	Not accepted

NPPSS deliver heavy and high velocity of kinetic energy on frontal bone; instantaneously cause mechanical damage on nerve fiber and subarachnoid brain hemorrhage. Therefore it is impossible if the mechanical stunning is reversible and does not cause central nerve damage. In addition, the frontal bone is a thin bone with a sinus below, therefore it is very difficult not to crack when hit with a stunner's head. This requirement has sparked a debate within the Muslim community as to whether stunning can be accepted as part of Halal slaughter, this is due to fears among Halal consumers, that, animals may die as a result of the stun [4].

CONCLUSION

Aspect of NPPSS practice that has attracted a lot of attention is animal welfare issue and whether stunning is halal or not. The main factor of effective stunning is enough power and correct stun placements. However, questions have been raised about the accuracy of the criteria used to confirm death before slaughter

REFERENCES

[1] Indonesian Council of Ulama [MUI]. 2012. *Guidelines of Halal Assurance System Criteria on Slaughterhouse*. Lembaga Pengkajian Pangan Obat-Obatan dan Kosmetika Majelis Ulama Indonesia (LPPOM MUI):Bogor

[2] Department of Standard Malaysia. 2009. Malaysian Standard (MS) 1500: Halal Food-Production, preparation Handling and Storage-General Guidelines. SIRIM Berhad, Selangor Darul Ehsan: Malaysia

[3] [BSN]. 2018. SNI 99003: 2018 Pemotongan Halal Pada Ruminansia. Badan Standarisasi Nasional Indonesia : Jakarta

[4] Fuseini A, Knowlesa T G, Hadley PJ, Linesc JA, Wotton SB. 2016. Halal stunning and slaughter: Criteria for the assessment of dead animals. Meat Siences DOI: 10.1016/j.meatsci.2016.04.033

[5] Grandin T. 2014. Recommended captive bolt stunning technique for cattle. http:/www.gramdin.com/humane/cap.bolt.tips.html [accessed 28/12/2017]

[6] Gilliam J, Shearer JK, Bahr RJ, Crochik S ,Woods J, Hill J , Reynolds J,. Taylor JD. 2016. Evaluation of brainstem disruption following penetrating captive-bolt shotin isolated cattle heads: comparison of traditional and alternative shotplacement landmarks. *Anim Welf*. (25): 347-353

[7] Vinimi RJ, Field RA, Riley ML, Varnel TR. 1983. Effec of delayed bleeding after captive bolt stunning on heart activity and blood removal in beef cattle. *J of Anim Sci.* 57 (3): 628-631