

Scientific Advisory Committee on Animal Health and Welfare

Opinion of the Committee on the question of the welfare advantages/disadvantages of restraining cattle, in the course of non-stun slaughter, (1) in an upright position, (2) rotated to ninety degrees, and (3) rotated to 180 degrees.

Restraint during Non-Stun Slaughter

From an animal welfare perspective, an essential requirement for the slaughter of livestock is effective restraint. There are a variety of restraint systems used for the non-stun slaughter of cattle, which can be broadly categorised into upright and rotary.

The original Weinberg rotating crate, which was manually operated, replaced traditional casting and shackling of cattle. Currently, rotating pens are operated by electrical or hydraulic systems with adjustable side plates, back pusher, neck yoke and chin lift with some having pressure limiting devices, to ensure that the animal is effectively restrained without exerting excessive pressure. The restrained animal is normally rotated to either 90 (lateral recumbency) or 180 degrees (dorsal recumbency).

Advantages of Rotary Restraint

1. Good presentation of the ventral surface of the neck for incision.
2. Generally less cuts are necessary when compared with upright restraint.

Disadvantages of Rotary Restraint

1. Stress response due to unnatural position causing impaired arterial oxygenation in dorsal recumbency in particular.
2. Contact between blood and rumen fluid with the cranial and caudal aspects of the wound causing potential carcass contamination, aspiration of liquid into respiratory tract and further stimulation of wound, which could cause further pain and distress.
3. Time interval between entry of animal until restraint is longer for rotating systems compared with upright restraint.
4. Time interval between animal being restrained and neck cut is longer than upright systems due to time taken to rotate the animal into position.

To address animal welfare concerns associated with rotating restraint, upright systems such as the Cincinnati pen were designed to enable the non-stun slaughter of cattle in an upright position. This system includes a chin lift to facilitate head restraint and blood flow following excision of the major blood vessels and a belly plate to provide support, to maintain the animal in an upright position post cut. Back pushers are also used and in some instances adjustable side plates.

Advantages of Upright Restraint

1. Animal can be slaughtered in an upright position.
2. Time interval between entry of animal into the device until restraint is shorter compared with rotating restraint.
3. Time interval between animal being securely restrained and neck cut is shorter in upright systems compared with rotary systems, due to time taken to rotate the animal into position.

Disadvantages of Upright Restraint

1. Ventral surface of neck is less well presented.
2. It requires an upward cut against the ventral aspect of neck, which is more awkward and may result in partial severance of the carotid artery on the contra lateral side.
3. Greater level of skill is required to achieve an appropriate cut.
4. Blood aspiration into the respiratory tract is possible.

Irish Context

In 2012, 1.4 million cattle were slaughtered in Ireland, of which 3.3% was for non-stun slaughter in accordance with Islamic and Jewish guidelines on animal slaughter (Table 1). The majority of non-stun slaughter in Ireland is for the Halal (i.e. Islamic) market.

Currently five Department of Agriculture Food and the Marine (DAFM) approved slaughter plants carry out non-stun slaughter of cattle for Islamic and Jewish markets. Two slaughter plants use a restraint device in which the cattle are rotated to 180 degrees prior to cut. Three slaughter plants restrain cattle in an upright position prior to slaughter. In general, upright restraint pens used for conventional slaughter (pre-stunned) were adapted for non-stun slaughter and are not specifically designed for the purpose.

In 2012, rotary restraint was used for 29% and upright restraint was used for 71% of the cattle non-stun slaughtered in Ireland.

Conclusions

Whilst the upright restraint system was intended to address welfare concerns relating to behavioural and physiological stress of the animal being inverted, current practice may result in poorer welfare outcomes. The available literature provides limited evidence on the welfare outcomes of restraint at non-stun slaughter. As detailed above, based on the existing literature both rotating and upright systems have advantages and disadvantages. The following can be concluded:

1. Regardless of restraint type, the time intervals between entry and restraint and time to the cut should be kept as short as possible.
2. New rotating pens are reported to be less stressful for cattle than the original Weinberg crate but a well-designed upright restraint system is likely to cause less physical discomfort (Grandin and Regenstein 1994).
3. In rotary systems, rotation to 90 degrees is reported to be less stressful than full inversion to 180 degrees (Von Holleben et al 2010).
4. Adjustable sides, neck yokes, chin lifts and back pushers should be designed with pressure limiting devices (Grandin and Regenstein 1994).
5. Prevalence of false aneurysms is not influenced by restraint type (Gregory et al 2008).
6. Animal must be completely insensible before release from restraint – this includes neck yoke, chin lift and belly plate.
7. A key consideration is the skill and competence of the operator to ensure the correct application of the restraint device.
8. Throat cut should be performed immediately after head restraint.

General Recommendations

1. Upright restraint pens are the preferred option for non-stun slaughter of bovines in accordance with recommendation (2) and provided that personnel are appropriately trained to slaughter animals in upright restraint pens. Rotating animals by 90 degrees is the second best option and rotation by 180 degrees is the least preferred option.
2. All upright restraint pens in use should fully conform to the 'Recommendations for design and operating criteria of Upright Bovine Restraining Pens' as detailed by FAWC.
3. Rotating restraints in compliance with Article 15 (2) of Regulation (EC) 1099/2009 may be used. Where rotary crates are used, rotation must not commence until the body, head and neck are sufficiently restrained. Rotating restraints must be designed to quickly and smoothly restrain and rotate the animal without interruption.
4. All restraints must be capable of fully restraining the animal until insensible before release and designed to allow a post cut stun if required.

5. Guidelines should be prepared to specify the design and operating criteria of bovine restraining pens for non-stun slaughter. These guidelines should be adopted as the industry standard and should at least conform with the basic principles of restraint device design common for all restraint systems recommended by Gibson (unpublished), FAWC (2013), and von Holleben et al (2010).
6. Existing requirements for Food Business Operators licenced for the non-stun slaughter of cattle as outlined in DAFM Trader Notice 15/2014 should be further developed with a view to providing more detailed requirements concerning restraint.
7. Operators (including replacement operatives) should be trained in all aspects of non-stun slaughter including effective animal restraint, appropriate cut, and assessment of incised surface and monitoring of the animal post cut.
8. DAFM should continue to monitor welfare outcomes in the course of their official controls at slaughter, including in respect of non-stun slaughter, and in particular to capture data on assessment/evaluation of operator skill and the restraint type.
9. Further consideration should be given to these recommendations once the European Commission submits its report to the European Parliament and to the Council under Article 27 (2) of Regulation (EC) 1099/2009 on systems restraining bovine animals by inversion.

Recommendations for Research

- A study comparing operator skill and welfare outcomes in bovines during non-stun slaughter in (a) an upright restraint device conforming to the document referred to in recommendation number 1 and (b) a Rotating Box with fully adjustable sides is recommended. Key welfare outcomes include time to reach unconsciousness and aspiration of blood into the respiratory tract.

Table 1. Summary of the number of bovines slaughtered in Ireland in 2012, including the numbers recorded for Halal (Islamic) and Shechita (Jewish) slaughter (without preslaughter stunning) and the type of restraint used

	Bovines
Total number slaughtered	1,396,059
Halal (2.6%)	36,297 ¹
Shechita (0.7%)	9,772
Total Halal & Shechita	46,069
Rotary restraint (29% of non-stun slaughter)	13, 360
Upright restraint (71% of non-stun slaughter)	32,709

Source: European Commission (unpublished data). Survey of restraining systems currently used for cattle at the time of slaughter.

References

Department of Agriculture, Food and the Marine (2014). Trader Notice: MH No. 15/2014
<http://www.agriculture.gov.ie/media/migration/foodsafetyconsumerissues/meathygiene/tradernotices/2014/AnimalWelfareSOPTN090414.pdf>

European Commission (unpublished). Survey of restraining systems currently used for cattle at the time of killing [Survey data for Ireland 2012]

¹ 28% of bovines slaughtered by Halal received a post-cut stun

FAWC (2013) Upright bovine restraining pens for non stunned slaughter – design and operating criteria. [Recommendations to DEFRA by FAWC's Welfare at Killing Standing Committee, 27/11/13].

Gibson, Troy (unpublished) Review of the current literature on upright and rotating systems for slaughter of cattle without stunning [Work Package 1.1. of EU-funded BOREST project]

Grandin T and Regenstein JM 1994. Religious slaughter and animal welfare: a discussion for meat scientists. Meat Focus International: 115-123.

Gregory NG, von Wenzlawowicz M, Alam RM, Animi HM, Sildere TY, Silva-Fletcher A, 2008. False aneurysms in carotid arteries of cattle and water buffalo during shechita and hala slaughter. Meat Science 79: 285-288.

Sant'Ana, Manuel (unpublished). Literature Review Of Welfare Outcomes Associated With Upright And Rotary Restraint During Non-stun Slaughter [on behalf of SACAHW]

Von Holleben K, Von Wenzlawowicz M, Gregory N, Anil H, Velarde A, Rodriguez P, Cenci-Goga BT, Catanese B, Lambooij E, 2010. Report on good and adverse practices – animal welfare concerns in relation to slaughter practices from the viewpoint of veterinary scientists: DIALREL Deliverable 1.3. <http://www.dialrel.eu/images/veterinary-concerns.pdf>