



Kosher slaughter paradigms: Evaluation of slaughterhouse inspection procedures



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ABSTRACT

Slaughter by Jewish religious rite is the killing of an animal by cutting the trachea and oesophagus and major blood vessels using a very sharp blade. This operation is subject to strict rules laid down by religious authorities that characterize its sacredness. The aim of the study was to evaluate the specific criteria inherent in the Jewish religious rite, by analysing reject rates during the different phases. In this study, 52.4% of the carcasses failed to quality as *Kosher*, with 22.9% being rejected due to pulmonary lesions and only 3% for miscuts. The study also revealed legal vacuums in the field of labelling rules.

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1. Introduction

Religious slaughter has become matter of debate because, in the view of the majority of the general public and experts in the trade, respect for religious rules implies greater suffering for the animals, which are immobilized and killed without *stunning* (Cenci Goga & Fermani, 2010).

Religious slaughter is peculiar to some cultures such as Judaism and Islam, and consists in the killing of a slaughter animal by cutting the trachea, oesophagus and blood vessels with a very sharp blade. This is performed according to precise rules prescribed by the religious rite (blessings or invocations), which characterize its sacredness (Italian National Bioethics Committee, 2003).

A number of concerns have been raised about animal welfare with regard to neck-cut slaughter without pre-stunning, i.e. the pain and/or distress caused by the restraining method, by the cutting method and after the cut. Gibson et al. (2009) and Gregory et al. (2012) found that slaughter without stunning causes pain. Moreover in both of these studies the special kosher knife was not used.

Kosher slaughter, known as *shechitah*, is the only method of animal slaughter for the Jewish Community; it involves the following specific phases: (i) choosing the animal, (ii) monitoring the animal's health, (iii) slaughter, (iv) inspection (*bedikà*) and cleaning (*nikkùr*) of the meat and (v) washing and salting of the meat to remove as much blood as possible (*koshering*) (Farouk et al., 2014).

Specific precepts define which animals are *kosher*, and therefore those animals may be slaughtered and can be eaten by all of the faithful. The characteristics that make mammals *kosher* are the presence of cloven hooves and the ability to ruminate (bovines, sheep and goats) (The New International Version (NIV) of the Bible (2011). *Leviticus* XI).

Before slaughter, animals considered *kosher* are transferred from lairages into structures used for their restraint. This period is defined as *pre-slaughter* and the procedures implemented during this phase are *handling* and *restraint* in order to facilitate slaughtering.

Proper animal *handling* can be achieved by applying the techniques set out in EC Regulation 1099/2009 related to *flight zone* and *point of balance*.

Common methods of restraining red-meat animals prior to *shechitah* include *full* or *half inversion in a rotary pen* and the *upright restraint system* (Farouk et al., 2014; Grandin & Regenstein, 1994).

Shechitah is the act of slaughtering an animal by a perfectly clean incision through the structures at the front of the neck: the trachea, oesophagus, carotid arteries and jugular veins. *Shechitah* is performed using a *Chalaf* (*Shechitah* knife) by authorized slaughter-men of the Jewish faith (*shochet*) (Rosen, 2004).

Whether animals are properly stunned in *kosher* slaughter is controversial. Some authors suggest that blood supply to the brain is cut off quickly, resulting in almost instantaneous unconsciousness, with death by exsanguination (Rosen, 2004), whilst other authors report that exsanguination and loss of consciousness may take up to 1 min or even more in some cases (Grandin & Regenstein, 1994; Hayes et al., 2015; Johnson, Mellor, Hemsworth, & Fisher, 2015) thus posing risks to animal welfare.

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Table 1
Carcass classification. Comparing percentage: communities of Rome/Milan.

Quality	Total sample	Rome total sample	Milan total sample
<i>Chalat</i>	19.0	18.5	20.0
<i>Kosher</i>	28.6	37.4**	8.8
<i>Rejected</i>	52.4	44.1**	71.2

Statistical significance: **P < 0.01.

The five most important principles of *shechitah* are that the neck should be cut without *pause*, *pressure*, *stabbing*, *slanting* or *tearing* (Rosen, 2004).

After slaughter, the animal is checked for the presence of any lesions, especially in the lungs and liver. According to the number and type of lesions found in the lungs and liver, the carcasses will then be classified as *chalak* or *glatt*, *kosher* or *terif* (Mast & Mac Neil, 1983; Hayes et al., 2015).

After inspection of the organs, some portions of fat and organs such as the kidneys, intestines, and the sciatic nerve, are removed through a process called *nikkur*. Because blood is not permitted to be consumed, all large arteries and veins are removed, as well as any bruised meat or coagulated blood; the meat is then purged of all remaining blood through the *koshering* process (Italian National Bioethics Committee, 2003; Farouk et al., 2014).

Religious slaughter is carried out legally in the European Union in licensed slaughterhouses and is regulated by EC Regulation 1099/2009 (Velarde et al., 2014).

The study, resulting from a partnership between the Food Safety Section of the Department of Veterinary Medicine at Bari University and a slaughterhouse in Apulia region, was conducted in the period between May 2015 and March 2016.

Therefore, the aim of this study was to determine the percentages of calves that qualify for kosher and identify the reasons for failure to pass kosher inspection. These data would be helpful to determine the amount of meat slaughtered without stunning that enters the conventional trade.

2. Materials and methods

2.1. Sampling

The data were collected by observing the Jewish religious slaughter, conducted in a slaughterhouse that had a full-inversion rotary pen. The observations were conducted by Rabbis from 2 different religious communities (Rome and Milan) from a total of 727 cattle from farms located in the same geographical area (Apulia region). The slaughtered animals included 383 calves under the age of 8 months (Alpine Brown breed) and 344 bull-calves aged between 8 and 12 months (Charolaise breed). Animal data and the slaughtering details (i.e. operator identification) were recorded.

2.2. Analysis of reject rates during pre-slaughter

At the slaughterhouse, we used a form to record the details of the animal, plus the parameters that must be met to ensure animal welfare, both before and during *shechitah*. Therefore, during pre-slaughter, we recorded the assessments by the religious authorities present during *handling* and during the *ante-mortem inspection*, which served to certify the animal's well-being/health before slaughter.

2.3. Analysis of reject rates during slaughter

The *shochet*, Rabbis and lay people at the slaughterhouse were interviewed, in order to analyze the slaughter technology used in the light of the strict rules dictated by religious dogma.

Our monitoring study also considered the five rules set out in the rite of slaughter (*shechitah*) that the *shochet* must apply in order to classify the carcass as *kosher*:

- (i) **Shehiyah**, שחייה, *pause*, there must be no interruption of the incision.
- (ii) **Dersah**, דרסה, *pressure*, there must be no pressing of the blade against the neck (this would exclude the use of a guillotine).
- (iii) **Haladah**, חלדה, *stabbing*, the blade must not be buried within the hide of cattle, wool of sheep or feathers of birds (i.e. the blade has to be of adequate length).
- (iv) **Hagramah**, הגרמה, *slanting*, the incision has to be made at the appropriate site on the neck, in effect that which permits the severance of the neck structures as quickly and as neatly as possible. Normally, the carotid arteries in the neck are severed at the position of C2 to C4, although when carotid arteries were severed at C1 there is lower risk of false aneurysm formation and premature arrested blood flow (Gregory et al., 2012).
- (v) **Iqqur**, עיקור, *tearing*, there must be no tearing of tissues (Rosen, 2004).

2.4. Analysis of reject rate during the post-mortem examination

Interviews were performed with the inspector (*Bodek*), in order to record the inspection procedures after slaughter, which involve the body examination as a whole as well as the lung and liver. The main reasons for carcass rejection were as follows: the existence of any specific inflammatory, non-specific or reparative-type processes, with specific reference to the presence of adhesions in the thoracic and abdominal cavities. Lung inspection, meanwhile, was conducted after inflating air into the lungs, using a hand held air pump (Hayes et al., 2015) and the examination included visualization of foci of pneumonia and other lesions (e.g. tissues adhesions) related to respiratory illness. In the case of suspected lesions, the carcass was rejected by the *bodek* and subjected to re-evaluation. According to the number and type of lesions found in the lung, the carcasses will be classified as: (i) *Chalak* or *Glatt* (the condition of the animal meets all the stringent Sephardic requirements, and so is *kosher* from all points of view. This means that the internal organs of the animal are in a perfect state of health); (ii) *Kosher* (meat is deemed suitable for consumption, despite small, but insignificant, imperfections in the lung) and (iii) *Terif* (does not meet the criteria of *kosher* meat at all and, therefore, is not to be consumed, as it is considered *unsuitable*).

2.5. Statistical analysis

At the end of the monitoring period in the slaughterhouse, all data were subjected to a descriptive statistical analysis, in order to assess: (i) the percentages of animals discarded; (ii) a possible relationship with the age of the animals slaughtered; (iii) any differences of opinion between the Rabbinic communities attending the slaughter. The statistical significance was determined by the chi-square test (Wonnacott & Wonnacott, 1984).

Table 2
Analysis of reject rate during pre-slaughter (values in %).

Pre-slaughter	Total sample	Calves	Bull calves
<i>Handling</i>	0.13	0	0.29*
<i>Ante-mortem</i>	0.13	0	0.29*

Statistical significance: *P < 0.05.

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