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Review on Different Concept for Meat Factory Inspection and Sanitation

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Abstract

Work is done in part in cell stations rather than production lines, which is how the Meat Factory Cell (MFC) concept differs from traditional abattoirs. It "disassembles" the carcass from the outside in, combining and fusing elements of today's separate processes and disciplines, namely "slaughter" and "meat primal cutting." where the internal organs are removed after the limbs, neck, back, and loin. The purpose of this effort is to qualitatively evaluate upcoming meat inspection and carcass hygiene in the MFC. To understand the importance of findings on individual carcass portions, a comprehensive analysis of the carcass components is required. The MFC offers a few chances for targeted examination using cutting-edge diagnostic equipment. Because the MFC concept removes the limbs, neck, and loin first, improved hygiene is anticipated. and are not vulnerable to faecal contamination from intestinal material. The MFC provides chances for customised chilling regime for distinct components, targeted cleaning or pathogen killing procedures, which should lead to safer meat products and less energy usage. We expect that the MFC approach will potentially fulfil the principles of Codex alimentarius and will improve public health compared to conventional slaughter and meat inspection

Keywords: Meat inspection; Meat factory cell; Risk assessment; Meat hygiene

Introduction

Food laws in the European Union (EU) and the European Economic Area (EEA) partially outline the proper methods for processing industrial meat. As an illustration, domestic ungulate carcasses may be divided into quarters or halves, and halves may not be divided into more than three wholesale cuts at slaughterhouses. A cutting plant is required to perform additional cutting and boning. Such conventional language discourages sound business growth and may hinder desperately needed innovation [1]. Functional requirements, however, would make room for novel strategies that incorporate and make use of contemporary technologies. "They must have facilities for disinfecting instruments with hot water supplied at not less than 82 C, or an alternative system having an equivalent temperature". Productivity growth is essential for the competitiveness of industrial sectors. In order to lower unit costs, the trend has been to increase efficiency by accelerating and scaling up production processes. Up until now, traditional line setups have been addressed by automation technologies. The main characteristics of modern meat production facilities include high capacity but high investments, little flexibility, and low reliability [2]. As a result, there has been a parallel tendency of standardizing animal characteristics and size to fit the factory. This conventional line-solution is getting closer to the point at which it is neither sufficient nor sustainable, particularly in markets with relatively low volumes, lengthy travel times, non-specialized slaughterhouses, and high labour demands. The issue of food security is also relevant from a global perspective: Technology for effective use of significant food resources is required in remote areas. We have looked at methods that can be automated for even smaller factories while also better achieving the goals of the rules than traditional methods of slaughter and cutting. It has been recommended to use the Meat Factory Cell (MFC) concept. In the electronic copy, there includes an animation of the MFC. The MFC will alter meat production and processing in three key ways [3].

Method

Better flexibility is made possible by the cell structure, and the asynchrony between cells also enables equipment and tempo adaption to account for variations in composition. As parallel cells may be operated differently, improvement and investment in automation might be made gradually. A number of parallel cells are used to calculate capacity. As a result, the MFC will offer a stable and flexible layout for the growth of plants and processes [4].

A new Regulation on official controls and other official activities done to ensure the application of food and feed law, rules on animal health and welfare, rules on plant health, and rules on plant protection products has been adopted by the European Parliament and the European Council. The enforcement of this regulation began. The process of reviewing the Meat Control Regulation will begin in the from 2017, the European Commission A risk reduction at least equal to that of conventional meat factories with traditional meat inspection verified in accordance with the same functional standards is often required for alternative approaches and new concepts. The recommended MFC idea is predicted to improve hygiene because it removes the meaty limbs, neck, and loin first, greatly limiting exposure to faecal contamination from intestinal material. The digestive system may then be successfully removed in its entirety [5]. In a perfect world, market access should be maintained while encouraging food producers to use documented improved methods and technologies. The best technology and solutions that satisfy functional legal criteria ought to be chosen by Food Business Operators (FBO). The goal of this work is to qualitatively evaluate meat inspection and hygiene in a new "meat factory cell" concept of pig carcass cutting and slaughter, and to determine whether the Codex alimentarius (CAC, 2005) principles, as well as the intentions and demands in the EU legislation, can be met. Most importantly, however, is to determine whether public health may be improved [6].

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Meat Inspection

History of Current Meat Inspection

The methods outlined by Robert Ostertag provide the foundation for meat inspection as it is currently carried out in the EU/EEA. Robert Koch's research on tuberculosis and new information on, for instance, the transmission routes for Trichinella spiralis and Taenia saginata in the 1890s formed the basis for a meat inspection that included visual inspection, palpation, and incision of pertinent lymph nodes and organs [7]. At that time, the meat inspection process was risk-based and concentrated on the current state of illness. Since then, the epidemiological situation has significantly changed as the prevalence of classical zoonoses like trichinellosis, brucellosis, tuberculosis, and others has decreased in the majority of wealthy industrialised nations. Other significant zoonoses have also evolved, including yersiniosis, campylobacteriosis, and salmonellosis, which are not yet detectable by existing methods. Additionally, methods used in meat inspection, such as carcass incision and palpation, have actually helped zoonotic germs like Salmonella and Yersinia enterocolica proliferate [8].

Codex Alimentarius

The Code of Hygienic Practice, published by the Codex Alimentarius Commission, details international standards and precautions to ensure that meat sold on markets is safe. According to Chapter 8.4 of the MFC, it is crucial that "all areas and facilities where bodies of animals are dressed or meat may be present are designed and constructed so that they facilitate good hygienic practises and that meat contamination is minimized to the greatest extent practicable." It is also crucial that "post mortem inspection procedures and tests should be established by the competent authority according to a science- and risk-based approach [9]." Consumer protection and good animal health and welfare are the goals of meat inspection. Numerous strategies are used during the process to achieve these goals. the value chain for meat. Ante mortem and post mortem inspection methods, as well as GHP, are essential for a safe meat supply at abattoirs. Generally speaking, "a contemporary risk-based approach to meat hygiene necessitates that hygiene treatments should be performed at those points in the food chain where they will be of greatest value in lowering food-borne risks to consumers." Application of specific procedures based on science and risk assessment should reflect this, with a focus on contamination prevention and control across all stages of meat production and subsequent processing [10]. A crucial component is the application of Hazard Analysis Critical Control Point principles. Additionally, "Meat hygiene criteria should control dangers throughout the entire diet to the greatest extent practical." In order to match meat hygiene requirements to the range and prevalence of dangers in the animal population from which the meat is produced, information from primary production should be taken into consideration.

Traditional Methods for Killing and Preparing Pig Carcasses

Until post-mortem examination is finished, parts of a slaughtered animal that are subject to meat inspection must still be able to be identified as coming from a particular carcass. After the carcasses have been eviscerated, the pluck, bowl, and intestines are presented side by side for post-mortem inspection. In many slaughterhouses, one inspector supervises the carcass displayed on one conveyor while a different inspector supervises the internal organs on a different conveyor. Viewing is required of all outside surfaces [11]. Then, cold storage protocols are applied to the finished carcasses. Because the entire carcass receives the same care, there is a compromise between hygienic standards and sensory attributes. Thin parts experience an excessive amount of temperature reduction, while thick parts may have a quicker or longer rate of temperature decline. Chopping and deboning of pork should, in accordance with EU law, be carried out in specialised facilities apart from those used for abattoir operations. The most typical method of deboning is hot deboning, however cold carcasses can also be cut. Tenderloins are often removed first, and the carcass halves are then divided into the three main cuts: the forepart, impart, and back part. Separate lines are used to continue processing these principal cuts. To meet the demand for various items in the marketplace, several cutting patterns are used [12].

Conclusion

In comparison to the practises used in conventional slaughterhouses, we anticipate that the MFC approach's meat inspection can be greatly improved. The suggested MFC meat inspection processes meet the "Code of sanitary practise for meat" and public health objectives of Codex alimentarius. Since the limbs, neck, and loin are removed first and are not exposed to faecal contamination from intestinal material, the MFC is also expected to improve hygiene and reduce the likelihood of exposure to significant undetected foodborne pathogens. The singeing and polishing may not completely remove contamination; therefore the rind may still contain some faecal contamination. The MFC offers potential for targeted cleaning, pathogen killing procedures, and customised chilling regimes for various sections, all of which should lead to safer meat products and reduced energy use.

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