



An operational hygiene inspection scoring system for Austrian high-risk companies producing food of animal origin



Lisa Stadlmüller ^{a, *}, Monika Matt ^b, Hans Peter Stüger ^a, Tanja Komericki-Strimitzer ^a, Karen Jebousek ^c, Martin Luttenfeldner ^c, Klemens Fuchs ^a

^a Austrian Agency for Health and Food Safety, Department of Statistics and Analytical Epidemiology, Zinzendorfsgasse 27/1, 8010 Graz, Austria

^b Austrian Agency for Health and Food Safety, Department of Statistics and Analytical Epidemiology, Technikerstraße 70, 6020 Innsbruck, Austria

^c Federal Ministry of Health and Women's Affairs, Radetzkystraße 2, 1030 Vienna, Austria

ARTICLE INFO

Article history:

Received 14 October 2016

Received in revised form

20 January 2017

Accepted 21 January 2017

Available online 24 January 2017

Keywords:

Hygiene inspection

Score

High-risk companies

Food of animal origin

Official control

ABSTRACT

This study investigates factors associated with operational hygiene of milk, fish and meat producers in Austria using official control data collected in 2014 and 2015. The control inspections ($n = 352$) were routinely performed by the state authorities comprising a survey as well as food and environmental sampling. The survey, developed in cooperation with official control in advance, was divided in four modules dealing with specific aspects for the three mentioned food categories as “conditions of the goods and their handling” or “microbiological criteria”. The operational hygiene inspection scores were concluded from numerical indicators for the status of operational hygiene and quality management. From 2014 to 2015, the operational hygiene inspection scores of milk and meat increased and of fish decreased. This indicates an improvement of hygienic management in Austrian milk and meat companies. One factor indicating the general fulfillment of the four survey modules was determined by factor analysis. The results confirm that companies with food rejections, meaning food samples deemed as unsafe (Regulation EC No 178/2002, 2002, article 14), wrong labelling (Regulation EC No 1169/2011, 2011) or insufficient hygiene (Regulation EC No 852/2004, 2004), received a lower score than companies without rejections. The design of a scoring tool for milk, fish and meat industries by using the survey in combination with routine data was achieved as objective of this study. Additionally, the analysis of sampling data on *Listeria* detection revealed a clear correlation: The detection of *Listeria* in companies without food rejections was statistically significantly lower than in companies with food rejections. In order to provide a better insight into the contamination status (e.g. *Listeria*) of high-risk companies the present study shows a method to combine results of a routine survey with available data from national control authorities.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Within the European Union general principles and requirements concerning food are set at EU level. An integrated approach to food safety “from farm to table” covers all sectors of the food chain. The main objectives of the general food law (EC No 178/2002, 2002) are: (1) guarantee of a high level of human life and health, including protection of consumer interests in relation to food and (2) free movement of safe and wholesome food: within the EU and globally, taking into account international standards

and agreements (except where this might undermine the high level of consumer protection pursued by the Union). The risk analysis principle, precautionary principle and transparency are claimed in the general food law to ensure safe food.

In Austria EU law is implemented in national law by the Federal Ministry of Health and Women's Affairs. Foodstuff is sampled at retail level and in previous production sectors as e.g. processing plants or primary production. A national control plan is published as ordinance of the Federal Ministry of Health and Women's Affairs. This annual control plan consists of several parts: the number and food category of samples at retail level (sampling plan), and the revision plan, which determines the number of food enterprises (e.g. restaurants, dairies, retail outlets etc.) that have to be inspected. Every food business has to be inspected regularly. The

* Corresponding author.

E-mail address: lisa.stadlmueeller@gmail.com (L. Stadlmüller).

inspection comprises sampling, hygienic investigations of the establishment and the employees, checking of HACCP (hazard analysis and critical control point) application, control of manufacturing processes etc. Approximately 70,000 producers (from farm to table) have been inspected by official control and 30,000 food samples have been investigated in 2015. According to the laboratory results and the compliance with labelling food samples are assessed and deemed as injurious for health or unfit for human consumption (food rejections) – or no reason for rejection.

Additionally, there are monitoring plans, so called campaigns, for specific food categories and specific food related questions (about 55–60 individual campaigns per year) (EFSA, 2015). The inspection of milk, fish and meat producers has been performed as campaign A-600 on the basis of the annual national control plan since 2014.

The aim of this campaign is to control the implementation of the general and specific hygiene requirements as well as the verification of own-checks in high-risk companies producing food of animal origin. Food samples have been assessed and deemed (injurious for health or unfit for human consumption) according to the general food law (EC No 178/2002, 2002, article 14, food safety requirements). In addition to the routine checks, which are laid down in the national control plan, the inspections in this campaign are more detailed with particular attention to the own-checks, including a food specific questionnaire. This questionnaire has been developed by the Austrian Agency for Health and Food Safety in cooperation with official control in advance. Product and environmental sampling are part of the inspections. The campaign intends to improve the process hygiene and the overall level of hygiene in milk, fish and meat high-risk companies.

In Austria high-risk companies are defined (Parliament of the Republic of Austria, 2011) as companies, which

- are approved companies according to Regulation EC No 853/2004 (2004) with specific hygiene rules for food of animal origin,
- produce products with an increased risk of bacterial zoonotic agents (for example *Listeria*, *Escherichia coli*, *Salmonella*, *Campylobacter*),
- produce and process medium or large food quantities.

For the purpose of assessing high-risk companies a questionnaire was comprised for milk, fish and meat producers to receive their “operational hygiene inspection score” (OHIS). This type of scoring and assessment tools was developed in other sectors including the fresh-cut produce sector (Tzamalís, Panagiotakos, & Drosinos, 2016) and food services (da Cunha et al., 2016). However, there was no such tool for scoring high-risk companies available in Austria at the time of writing. In order to close this gap, the objective of this study was to design a scoring tool for milk, fish and meat industries.

2. Material and methods

All Austrian high-risk producers of milk, fish and meat were considered in the analysis, except for companies processing less than 500 tons of milk or less than 150 tons of meat per year. No processing limit was applied to fish because of the small number of fish producers in Austria. The questionnaire was used as template in Excel 2013 (Microsoft Corporation, Redmond WA, USA) and was specifically developed for milk, fish and meat producers. The Excel template was also tested for older versions as Microsoft Excel 2010 and 2007.

The survey deals with basic hygiene aspects as well as the principles of the hazard analysis and the critical control point

(HACCP) concept (EC No 852/2004, 2004). Data collection was carried out between January 2014 and December 2015. All evaluations were accomplished by trained inspectors of the veterinary and food safety supervisory authorities without prior notice to the company. During the audits the inspector filled in the questionnaire together with the company's owner and manager. Additionally the inspector collected food samples and environmental samples on his inspection round through the company. Food samples were taken by the inspector from cheese, butter or other milk products (at milk industries), smoked meat, sausages or other meat products (at meat industries) and fish products (at fish industries). The environmental samples included swab samples, surface samples, floor drain water samples or product-associated samples (e.g. slicer dust). The inspector took environmental samples at product-associated surfaces, processing equipment or filling and packaging machines. All samples were sent to the microbiological laboratories under controlled temperature condition within 24 h of collection. The samples were tested and assessed at the Austrian Agency for Health and Food Safety (AGES) and at state testing facilities (Vienna, Carinthia, Vorarlberg).

In Austria the assessment of food and environmental samples is performed by authorized experts according to EU regulation (e.g. EC No 852/2004, 2004; EC No 178/2002, 2002). In the European Union food is assessed and deemed according to the general food law, as “Food shall not be placed on the market if it is unsafe”. Two categories of unsafe food are listed in EU Regulation EC No 178/2002 (2002, article 14): (2) a) injurious for health or b) unfit for human consumption. Other reasons for rejection were insufficient hygiene (according to EC No 852/2004, 2004; EC No 178/2002, 2002) or wrong labelling (according to EC No 1169/2011, 2011). Complementary to the defined reasons of rejection the category “suggestions for food business operators” is used by some authorized experts. These suggestions indicate room for improvement for food producers.

2.1. Survey design and calculation of the score

The survey is divided into four modules. In order to direct the respondents to the correct subsequent questions the Excel template includes multiple filter questions. All questions in the milk and fish survey had a dichotomous scale (yes/no), some of them with an additional option “not applicable”. Additionally, the meat survey included questions with three to four predetermined answers.

The operational hygiene inspection score is calculated in a tiered approach. First, the answers are weighted (equally for milk/fish, weights between 0.2 and 4 for meat) and the degree of fulfillment for each module is determined. Then the weighted sum of all module scores (equally weighting for milk/fish, see Table 1 for weights of meat modules) represents the operational hygiene inspection score. A group of experts on food determined the weights of the questions and the key for the meat modules to gradate and emphasize specific questions/items. The expert group was set up by

Table 1
Number of questions/Sum of possible total points for every module.

| | Milk | Fish | Meat |
|---------------|--------------------|--------------------|--------------------|
| First module | 9/9 ^a | 9/9 ^a | 28/25 ^b |
| Second module | 5/5 ^a | 3/3 ^a | 14/13 ^b |
| Third module | 7/7 ^a | 5/5 ^a | 5/10 ^c |
| Fourth module | 31/31 ^a | 26/26 ^a | 3/3 ^c |
| All modules | 52/52 | 43/43 | 50/51 |

^a These modules were equally weighted with 25%.

^b These modules were weighted with 30%.

^c These modules were weighted with 20%.

Download English Version:

<https://daneshyari.com/en/article/5767560>

Download Persian Version:

<https://daneshyari.com/article/5767560>

[Daneshyari.com](https://daneshyari.com)