

Consumer habits in nine European countries captured to assess the risk of foodborne infections

Main author: Marieke Opsteegh (National Institute for Public Health and the Environment)

Co-authors: Arno Swart, Nadja Bier, Anne Mayer-Scholl, Gereon Schares, Solveig Jore, Rebecca Davidson, Helga Waap, Rafael Calero Bernal, Gema Alvarez Garcia, Radu Blaga, Filip Damek, Sara Monteiro Pires, Christen Rune Stensvold, Jacek Sroka, Mirosław Rozycki,

INTRODUCTION

Consumer surveys are often carried out to monitor dietary intake and the data obtained are not specifically designed to capture behaviours associated with the risk of foodborne infections. In the One health EJP Joint Research Project TOXOSOURCES, we collected exposure data suitable for quantitative microbial risk assessment (QMRA) purposes from nine European countries in a harmonised way. In particular, the design of the survey enabled quantifying variation between consumers, correlations in behaviour, and uncertainty quantification. Questions were tailored to capture behaviours relevant for *Toxoplasma gondii* infections. Since this zoonotic parasite can be transmitted via the meat of infected animals, contaminated vegetables and soil exposure, the data will also be useful for many other pathogens sharing similar transmission routes.

METHODOLOGY

An online questionnaire with 34 multiple-choice questions was distributed by a market research agency among consumer panels in the Czech Republic, Denmark, France, Germany, the Netherlands, Norway, Poland, Portugal and Spain. The targeted number of respondents by country was 2 000, except Denmark and Norway, with 3 000 respondents each. The sample drawn was representative of region and education level. After the survey, the data were weighted by age, gender and urbanicity. Respondents answered questions on the frequency of consumption and portion sizes for a range of meat products (including country-specific specialties) and raw vegetables, on specific risk behaviour such as tasting raw meat and drinking unpasteurised milk, on heating preferences, storage conditions and washing of vegetables, and on buying organic meat and ready to eat vegetables. Bayesian statistics was employed to derive probability distributions for each question.

RESULTS

Substantial differences between countries were observed. For example, almost 50 % of respondents in Denmark reported eating meat 2-6 times per week, while this was less than 20 % for France and Germany. We obtained detailed results on consumption frequencies on a large number of food categories, such as raw vegetables (18 categories) and meat (22 categories). Additionally, in each country, a number of local meat specialties were selected based on expected risk. Also relevant – by directly determining the ingested dose – are portion sizes. These were obtained in broad categories (meat cuts/meatballs/sausages), and here too differences between countries were observed. Storage locations and freezer temperatures did not seem to vary much between countries. A further noteworthy result is that the preference for raw and rare meat was highest in France.

DISCUSSION

The current food survey distinguishes itself for being tailored to risk-assessment applications. Typical food surveys are developed from a dietary perspective and focus on nutrient intake. Our survey also includes a range of questions relevant for exposure assessment of different foodborne pathogens. Importantly, we did not employ a recall or diary of a limited number of days, but instead asked respondents about their experiences of the past year. This allows for a more precise estimation of variations among consumers for rarely eaten products that may be risky though rarely consumed.

Another strength of the approach is that the data is collected in a harmonised way for several EU countries, enabling comparison and inclusion in risk-assessments transcending country borders.

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