Meat consumption in Europe – results from the EPIC study

Linseisen J.[2], Kesse E.[2], Slimani N.[1]
(for the EPIC working group on dietary pattern, subgroup meat)

[1]International Agency for Research on Cancer (IARC), Lyon, France. [2]German Cancer Research Center, Heidelberg, Germany.

Purpose

Consumption of meat – most likely red meat and processed meat – is reported to modulate cancer risk of different sites, e.g. colorectal cancer and breast cancer. In this evaluation, meat consumption patterns will be compared across all European cohorts participating in EPIC (European Prospective Investigation into Cancer and Nutrition). The data given should provide valid information on the exact exposure level for meat and meat subgroups in the different EPIC cohorts. Moreover, the results might be used for calibration of the dietary instruments used to assess usual dietary intake in all EPIC participants.

Methods

In a representative subsample of the EPIC cohorts (27 centres) across 10 Western European countries (France, Italy, Spain, United Kingdom, Germany, The Netherlands, Greece, Sweden, Denmark, Norway), 24-h dietary recalls were assessed by means of the standardized computer program EPIC-SOFT. Single dietary recalls of 22 924 women and 13 031 men (age range, 35–74 years) were evaluated. The given mean intake results for total meat and meat subgroups (e.g. red meat, processed meat) were adjusted for the age of the participants as well as for the recall weekday and season. Factors influencing meat intake were identified by means of analysis of variance. Over the whole study population, about 400 EPIC participants stated they were vegetarian (vegans, ovo-lacto vegetarians, fish eaters with no or low meat intake), most of them originating from the health-conscious cohort in the UK.

Results

Mean total meat intake was lowest in the health-conscious cohort in the United Kingdom (15 g/day and 21 g/day in women and men, respectively), followed by EPIC Greece (47 g/day and 79 g/day, respectively). The highest meat intake was observed in the Northern Spanish EPIC cohorts, especially in San Sebastian, with 124 g/day and 243 g/day in women and men, respectively. Besides Greece, most other Mediterranean EPIC centres in Spain and Italy (except EPIC Naples) also revealed comparably low meat intake data. At the county level, the highest mean meat intake in women was found for the French EPIC participants.

Differences in the intake of meat subgroups across EPIC were even higher than found for total meat intake. The EPIC cohorts in The Netherlands, Germany and the Nordic countries (Denmark, Sweden, Norway) showed, to a certain extent, comparable meat consumption patterns, with a high proportion of processed meat (sausages) and a lower intake of poultry as compared to most Mediterranean EPIC centres and the EPIC UK cohorts. Additionally, in most Mediterranean centres, less pork and more veal/beef was consumed than elsewhere in EPIC. Except EPIC Ragusa, the most pork was consumed in the German, Swedish, Danish, and Dutch centres. In contrast, ruminant meat intake was highest in the EPIC centres of Northern Spain, Italy and France. Overall, mean red meat intake varied between 2 and 57 g/day in female participants and between 8 and 121 g/day in male participants of the different EPIC cohorts. The highest sausage intake was observed for the German EPIC participants, followed by the Nordic cohorts and the Dutch. Also, rarely consumed types of meat were

evaluated, with the results indicating that meat from rabbits was more frequently consumed in French, Italian and Spanish EPIC cohorts while game consumption was higher in the Swedish and Norwegian centres.

Saturday and especially Sunday were the weekdays with the highest meat consumption; meat intake on Friday was the lowest. A higher body mass index as well as smoking was associated with a higher meat intake; older age and better education are predictive of a lower overall meat intake (all adjusted for energy intake).

Conclusions

The given high variation in total meat consumption as well as in the consumption of different meat subgroups demonstrate the heterogeneity within EPIC. Therefore, it is likely that results from EPIC will substantially contribute to our knowledge of the role of dietary meat in the etiology of chronic diseases, especially cancers of different sites.