**Article Characterization and Charting Form**

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| **Q#** | **Question** | **Options** | **Comments** |
| 1 | Is this a relevant primary research study that investigates the efficacy of an intervention to improve the food safety knowledge, attitudes, and/or behavioursof food handlers at retail and food service? | Yes  No, specify primary reason for exclusion:   * No relevant intervention investigated * No relevant population investigated * No relevant outcomes investigated * Not primary research * Cross-sectional study * Other:\_\_\_\_\_\_\_\_\_\_\_\_   If “no” is selected, submit form without proceeding further. | *Knowledge, attitudes, and behaviours:*  Includes knowledge, attitudes, and behaviours (self-reported or observed), as well as behavioural intentions and any other psychosocial construct (e.g. self-efficacy) related (but not limited to) any of the following topics:   * personal hygiene (e.g. hand-washing); * preventing cross contamination (e.g. separate cutting boards for raw/cooked meat); * adequate cooking of food (e.g. use of thermometers to check doneness); * time-temperature control (e.g. prompt cooling / adequate reheating of food);   **Food safety inspection scores or infractions and microbial contamination outcomes will also be included** as a secondary outcome of interest. Review scope only includes **food handling at retail / food service**, related to prevention of **microbial hazards**.  *Food handlers:*  Includes food premise employees, workers, managers, caterers, butchers, and others who handle and prepare food at retail / food service. **Exclude studies on consumers who prepare food at home. Also exclude studies conducting at the farm/pre-harvest and processing levels.**  *Intervention:*  Includes training classes, courses and curricula, educational materials (e.g. posters, brochures), and any other intervention to improve food safety knowledge, attitudes, and behaviours among food handlers.  *Relevant study designs:*  Any experimental designs (e.g. randomized controlled trials (RCTs), non-randomized trials, controlled and uncontrolled before-and-after (pre-post) studies).  Also includes observational studies: cohort, case-control, and interrupted time series.  **Cross-sectional studies** that look at differences in relevant outcomes in food handlers based on their training status (e.g. as measured on a questionnaire) **should be excluded.**  *Include*   * Include all publication dates and types, including grey literature * Studies where you “can’t tell” the relevance and suspect it could be relevant   *Exclude*   * Studies conducted on consumers or on food handlers at points in the food chain other than retail/food service (e.g. processing) * Studies with no intervention evaluated * Research related to non-microbial hazards (e.g. food allergies). |
| 2 | Were any outcomes sufficiently reported to allow for meta-analysis? | Yes, at least some outcomes are sufficiently reported  No (exclude study and submit form) | **Only answer this question with respect to outcomes relevant to the review question**  **Dichotomous:**   * + Numerator **and** denominator, **or**   + Proportion + EITHER numerator or denominator **or** * Measure of association (e.g. odds ratio, relative risk) + EITHER a measure of variability (SE, CIs, variance) or an exact P-value   **Continuous:**   * + Mean, sample size, + EITHER a measure of variability (e.g. SD, CIs) or exact P-value/t-value **or**   + Sample size and P-value/t-value from t-test **or**   + Difference in means and a measure of variability (SD, SE, CIs, variance) **or**   + Difference in means, sample size, + EITHER a common SD or an exact P-value /t-value from t-test |
| 3 | What is the publication year of this article? | \_\_\_\_\_\_\_ |  |
| 4 | What type of document is this article? | Journal article  Thesis  Conference paper/abstract  Government or research report  Other, please specify:\_\_\_\_\_ |  |
| 5 | What is the article language? | English  French  Spanish | **Exclude in Q1** studies in languages other than English, French, or Spanish |
| 6 | Where was the study conducted?  *(Check all that apply)* | North America:   * Canada, province:\_\_ * USA, state:\_\_ * Mexico   Europe:\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Australasia:\_\_\_\_\_  Central and South America/ Caribbean:\_\_\_\_\_\_\_\_  Asia:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Africa:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Not stated | **Central-South America/Caribbean:** [Please specify country only and use full name e.g. Columbia; do not include region etc.]  **Europe:** includes, Belarus, Latvia, Ukraine, Estonia, Cyprus & west (inc. Iceland and Greenland) [please specify country only and use full name].  **Asia:** Russia, Turkey, middle eastern countries and east  **Australasia** is limited to Australia, New Guinea, New Zealand, New Caledonia, and neighbouring islands |
| 7 | When was the study conducted? | \_\_\_\_\_\_\_\_\_\_\_  Not reported | Please specify year/month to year/month if available (do not extract days) [follow format example: 2000/06-2000/08] |
| 8 | What is the study design?  *(Check all that apply)* | Observational study:   * Cohort * Case-control * Interrupted time series (ITS) * Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_   Experimental study:   * Randomized controlled trial (RCT) * Non-randomized (or quasi-randomized) controlled trial * Controlled before-and-after study * Uncontrolled before-and-after study * Other:\_\_\_\_\_\_\_\_\_\_\_\_\_   Other, please specify:\_\_\_\_\_\_\_ | **If more than one design, report ONLY study design(s) relevant to the research question.**  **Observational study:** Assignment of subjects into a treated group versus a control group is natural (outside the control of the investigator).   * **Cohort study**: is a study in which one or more groups of individuals with differing exposures to a suspected risk factor/predictor are observed and followed through time for occurrence of an outcome. * **Case-control study**: compares exposure to the risk factor/predictor in subjects who have an outcome ('cases') with those who don’t have the outcome, but are otherwise similar ('controls') and drawn from the same sampling frame. * **Interrupted-time-series (ITS) study:** A study that uses observations at multiple time points before and after an intervention (the ‘interruption’). No separate control group, but multiple measurements (at least 3) are made before AND after the intervention.   **Experimental study:** Each subject is assigned to a treated group or a control group before the start of the treatment   * **RCT:** an experimental study in which people are allocated to intervention/comparison groups using random methods. * **Non-randomized controlled trial:** An experimental study in which people are allocated to different interventions using methods that are not random. * **Controlled before-and-after study:** A study in which observations are made before and after the implementation of an intervention, both in a group that receives the intervention and in a control group that does not. * **Uncontrolled before-and-after study:** observations are made on a population before and after receiving an intervention (with not separate control group). |
| 9 | What types of food handler populations were assessed as part of the outcome measurements to determine intervention effectiveness?  *(Check all that apply)* | Employees  Managers / operators  Mix of food handlers (e.g. employees, managers, other)  Other, specify:\_\_\_\_\_\_\_\_\_  Not specified | Select “employees” or “managers / operators” only if the outcomes are specifically reported and/or are separated/stratified for one or both of those two groups |
| 10 | In what types of food premises did the population work?  *(Check all that apply)* | Restaurants  Caterers  Butcher shops  Delis  Grocery stores  Healthcare institutions (e.g. hospital, nursing home)  Elementary / high schools  Colleges / universities  Lodging facilities (e.g. hotels, motels)  Street food vendor  Other, specify:\_\_\_\_\_\_\_\_\_  Not specified |  |
| 11 | Was the study focused on food handlers/ premises with any targeted socio-demographic characteristics? | Yes, specify:\_\_\_\_\_\_\_\_\_\_\_\_\_  No / not reported | **Select options ONLY if the group was the main focus/target population of the study AS SPECIFIED BY THE AUTHORS**  E.g. ethnic restaurant operators, independent (vs. franchise/chain) establishments |
| 12 | What types of interventions were investigated?  *(Check all that apply)* | Training course or session  Messaging materials (e.g. brochures, posters)  Multi-faceted intervention  Other, specify:\_\_\_\_\_\_\_\_ | **Multi-faceted**=includes multiple components, such as a training course, messaging materials, and/or other combinations of interventions (e.g. incentives, feedback, etc.) |
| 13 | Which of the following components were included in the intervention? *For each option, specify details in text box*  *(Check all that apply)* | In-person course, specify:   * One-to-one * Group   Online/web-based modules  Print media messaging (e.g. posters)  Digital media messaging (e.g. videos)  Social media messaging  Incentives  Provision of resources (e.g. thermometers)  Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Not reported | **Print media:** e.g. newspapers, newsletters, brochures, posters.  **Digital media:** Any combination of print/text, audio, images, video, and/or interactive activities.  **Social media:** Interactive exchange of information in virtual communities and networks (e.g. forums, Facebook, Twitter, YouTube). |
| 14 | Was the content of the intervention described? | Yes  No | **I.e. did the paper describe the types of food safety/food handling topics that were covered by the intervention?** |
| 15 | What food safety topics were covered by the intervention?  *(Check all that apply)* | General food safety  Personal hygiene  Adequate cooking of foods  Avoiding cross-contamination  Time-temperature control  Avoiding food from unsafe sources/high-risk foods  Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Not specified | **NOTE:** If content of intervention wasn’t described, answer this question based on types of outcome measures reported.  **General/background food safety:** Includes topics such as foodborne pathogens/other hazards, illness/outbreaks, epidemiology, symptoms, diagnosis, treatment, etc.  **Personal hygiene:** hand-washing, avoiding food preparation when ill.  **Cooking:** cooking temperatures, use of thermometers when cooking.  **Cross-contamination:** cleaning of food preparation surfaces and equipment, separation of raw from cooked/RTE foods, safe water for food preparation, washing fruits/vegetables, and pest control.  **Time-temperature control:** maintaining refrigerator temperatures, reheating and defrosting.  **Food from unsafe sources/high risk foods:** e.g. raw milk, uncooked seafood, ungraded/raw eggs, unpasteurized juices. |
| 16 | Was the intervention design informed by any theories of behaviour change? | Yes, specify all that apply:   * Theory of Planned Behaviour/Reasoned Action * Health Belief Model * Stages of Change Theory/Transtheoretical Model * Other:\_\_\_\_\_\_\_\_\_\_\_\_\_   No / not specified | **Select any of the options ONLY IF AUTHORS EXPLICITLY INDICATED the theory was used.** |
| 17 | Was the intervention design informed by any formative primary research? | Yes, specify all that apply:   * Focus groups * Interviews * Previous surveys / research * Expert panel * Other:\_\_\_\_\_\_\_\_\_\_\_\_   No / not specified | **Formative primary research** = research done prior to development of the study to inform the details of the study.  **Previous surveys / research** = explicit reference to previous survey studies or research literature as a basis for development of the intervention |
| 18 | Were members of the target population engaged in the development of the intervention? | Yes  No / not specified |  |
| 19 | Did the intervention involve any facilitators or instructors? | Yes, specify all that apply:   * Educators/extension personnel * Dieticians/nutritionists * Public health inspectors/ environmental health officers * Members of the target population (food handlers) * Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   No / not specified |  |
| 20 | What was the intervention setting *(where was the intervention applied/ delivered)?*  *(Check all that apply)* | In the workplace/food premises  Government facility  Private company facility  School/university/college  Internet/online  Homes of food handlers  Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Not reported |  |
| 21 | What was the intervention dose and duration? | Dose:\_\_\_\_\_\_\_\_\_\_\_\_\_  Duration:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Not reported | **Dose:** refers to how often (and/or how much of) the intervention was applied (e.g. number of sessions conducted).  **Duration:** refers to how long the intervention was applied for.  NOTE: Where possible provide units of measurement (e.g. total hours, weeks, etc.) |
| 22 | What type of “intervention” did the comparison (control) group receive?  *(Check all that apply)* | No intervention  Standard/traditional intervention, specify:\_\_\_  Other, specify:\_\_\_\_  Not reported  N/a – uncontrolled before-and-after study or interrupted time series |  |
| 23 | What types of outcomes were measured?  *(Check all that apply)* | Knowledge  Attitudes and risk perceptions  Behaviours / practices, specify how measured:   * Observed * Self-reported   Behavioural intentions  Beliefs about capabilities (e.g. self-efficacy)  Food safety inspection scores  Microbial contamination of foods, personnel, or the environment  Other, specify:\_\_\_\_\_\_\_\_\_ | **Specify exact measures in text boxes. If reviewer can’t determine where to place the construct, put in “other” to be classified later.**  **Knowledge =** An awareness of the existence of something. E.g. scores or correct answers calculated from tests, quizzes, etc.  **Attitudes and risk perceptions =** broad category that might include constructs such as perceived threat of causing foodborne illness (chance of occurrence, susceptibility, severity) and/or general concerns or beliefs about food safety.  **Beliefs about capabilities =** refers to an individuals’ self-confidence in abilities. Includes “**perceived behavioural control**”**,** a construct of the Theory of Planned Behaviour, as well **as self-efficacy**, which conceptually measure the same construct (an individual’s confidence/belief in their ability to perform safe food handling).  **Intentions =** motivation or intention to perform safe food handling, including an individual’s “stage of change” in the Transtheoretical Model. |
| 24 | How were the outcome data collected?  *(Check all that apply)* | Questionnaire:   * In-person * Telephone * Postal * Web-based * Not reported   Participant observation:   * Direct observation (in person) * Video cameras * Other, specify:\_\_\_ * Not reported   Other, please specify \_\_\_\_\_\_  Not specified |  |
| 25 | Were baseline (pre-intervention) measurements of outcomes reported? | Yes, specify length of time before intervention: \_\_\_\_\_\_  No / not specified | Will always be yes for before-and-after studies. |
| 26 | How often were the outcome data measured after the intervention was delivered? | One occasion, specify length of time/follow-up after intervention: \_\_\_\_\_\_\_\_\_  More than one occasion, specify length of time/follow-up between each measurement:\_\_\_\_\_  Not reported | Specify the UNIT OF MEASUREMENT (e.g. hours, days, weeks, months, years) |
| 27 | Was the data collection instrument (e.g. questionnaire) pre-tested? | Yes, specify all that apply:   * Expert review * Cognitive interviews with participants * Pilot study with participants * Not specified * Other:\_\_\_\_\_\_\_\_\_\_\_\_\_   No / not specified | **Only indicate testing of “entire questionnaire instrument” in this section.**  **Cognitive interviews =** qualitative technique where surveys are given to a limited number of participants (e.g. 10) from target population and they are asked to “talk aloud” (or are asked by investigators) about their thoughts as they go through each question. Usually conducted after questionnaire is developed, after any expert review, and before formal pilot testing to determine whether there are any significant design problems in the questions.  **Pilot study =** quantitative pre-testing of the questionnaire by administrating to a sample of the target population (e.g. 100-200 people) before the full study and analyzing their responses to detect any problems/patterns of misinterpretation. Emulates procedures proposed in main study. |
| 28 | Additional comments: | \_\_\_\_\_\_\_\_\_\_ |  |