

**Supplementary material 1. Posters displayed at butcher
shops during the food safety intervention**

The intervention included a poster entitled "**Clean Shop, Clean Butcher, Happy Customer**" to reinforce meat handlers' adherence to the '5 Cleans' (clean hands, clean clothes and cloths, clean water, clean surfaces, and clean tools) and the '3 Safes' (separate, sanitize, and safe storage) safe food handling practices and reduce the risk of foodborne illness. The poster was displayed prominently within each butcher shop to provide a continuous visual cue for meat handlers during routine work.

CLEAN SHOP, CLEAN BUTCHER, HAPPY CUSTOMER

Follow the 5 Cleans and 3 Safes to protect yourself and your customers from harmful bacteria that can cause illness.

5 CLEANS



CLEAN HANDS
Use soap and water



CLEAN WATER
Use water directly from the tap or treat



CLEAN SURFACES
Chopping boards and counters



CLEAN TOOLS
Between use of offal and meat



CLEAN CLOTHES
Visibly free from dirt

3 SAFES



STORE WELL
Off the ground and on a clean surface away from flies and insects



SEPARATE
Keep offal, cooked meat, vegetables and fresh meat separate. Keep aged meat separate from fresh meat



SANITIZE
Use sanitized/disinfected knives and tools and follow food safety guidelines

The "**Clean Hands, Happy Customer**" poster depicted the recommended handwashing procedure and was displayed at the handwashing station in each butcher shop to reinforce proper hand hygiene practices among meat handlers.



The intervention also included a poster entitled "**Protect Yourself**" which encouraged customers to assess the hygiene status of butcher shops before purchasing meat. The poster highlighted key hygiene indicators, including the cleanliness of meat handlers' hands, work surfaces and tools, the use of clean protective clothing (gowns and hairnets), and the shop's food inspection rating. But this poster has no inspection rating as it was posted at TNM shops. These posters were posted at places where customers can easily see while purchasing meat from shops.



Similar to the **"Protect Yourself"** poster described above, this version encouraged customers to assess the hygiene status of butcher shops before purchasing meat. In addition, it incorporated the shop's food inspection rating, presented as a star-based score, as an indicator of hygiene status. The poster was displayed only in TNMI shops at locations readily visible to customers.



Meat handlers signed this poster to demonstrate their commitment to implementing the hygiene practices introduced during the intervention. The signed poster was displayed in a prominent location within the shop to provide a continuous reminder of their pledge.

I _____ PLEDGE TO
(Insert name here)
**MAINTAIN THE STANDARDS OF HYGIENE AND
SANITATION I HAVE BEEN TRAINED ON, AT MY
BUTCHERY.**

I will regularly clean and sanitize all surfaces, equipment, and tools to prevent contamination of meat products. I will also follow proper hand washing protocols and wear a clean gown and hairnet, to ensure the safety of myself and my customers.

I understand that the maintenance of these practices is important in preventing the spread of harmful bacteria and diseases, and I take this responsibility seriously.

As a butcher, I am committed to upholding these standards and practices in my daily work.



Supplementary material 2. List of hygiene materials provided to the butcher shops

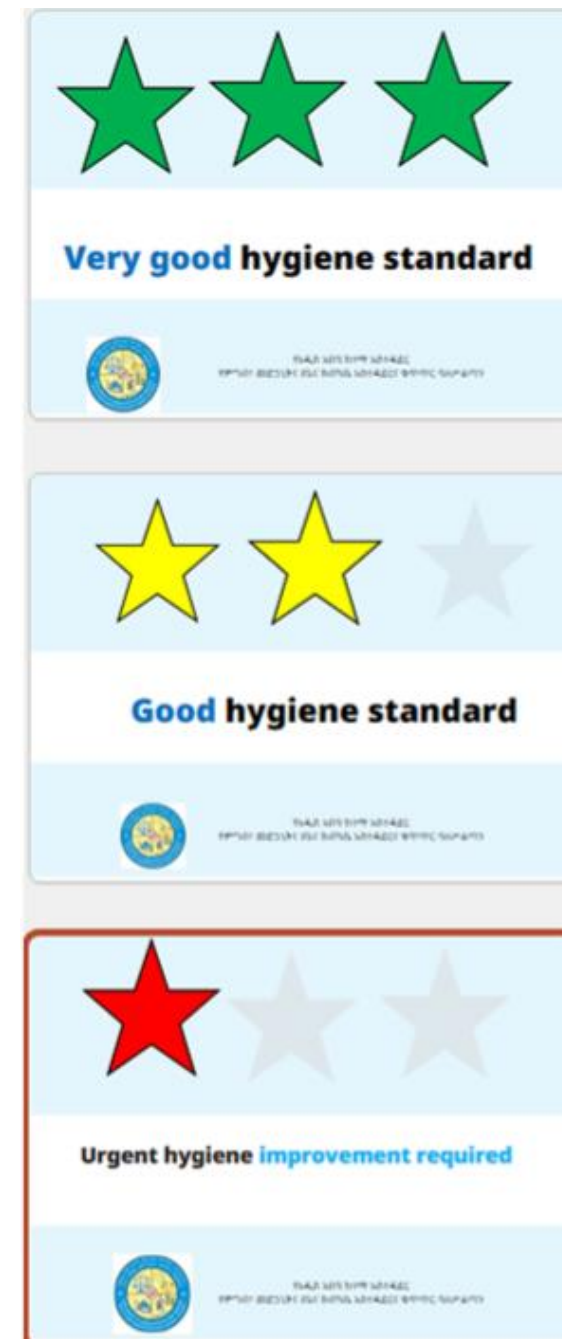
Items	Quantity per shop	Guide on use of the hygiene materials
Hand sanitizer	2 bottles	It is good to sanitize your hands using sanitizer after washing or in between work. This helps to kill germs which are not visible to our eyes.
Liquid soaps (Laundry detergent)	1 bottle	Soaps are important for effective cleaning of all materials. We will provide you with a bottle 'largo' which can be used to wash gowns, hairnets, towels. You may have already such kind of soaps and continue purchasing for your meat shop hygiene.
Cutting boards	3 pieces	We highly recommend using a separate cutting board for stomach and red meat. We are giving these relatively small cutting boards, which may be used only for stomach/offal only.
Microfiber wiping towels (grey, yellow, blue)	12 (4 pieces from each colour)	We will give you wiping towels of three different colours (grey, yellow, blue). We recommend cleaning cloth to be different colour for different levels of dirtiness. We are giving you now towels of three different colours and recommend using as I am going to tell you now. Grey to clean dirty surfaces such as removing food residues and debris. After this, the surface will be cleaned with soapy water. Then, yellow towel will be used to wipe the surface. Finally, the surface will be disinfected and dried with the blue towel soaked with disinfectant.
Buckets (Red, pink, green)	3 (1 piece from each)	We will provide you cleaning buckets of three different colours (red, pink, green). Like the towels, we also recommend using buckets of different colours for soaking the towels during cleaning. Red bucket will be used with grey towel (water with no soap); pink with yellow towel (contain soapy water) and green bucket is used with blue towel (towels to be sprayed when sanitizing food contact surface). These different colour buckets serve as reminder for our mind to differentiate levels of cleanliness during cleaning and busy time.
Brush	2 (2 pieces)	Brushes will be used to scrub surfaces during cleaning. The brushes given to you here can be especially used for cleaning chopping logs.
Dishwash liquid soaps	1 bottle	Food contact surfaces (knives, knife files, axes) need special soap (dishwash) specifically prepared. Do not use laundry soap for cleaning meat contact utensils. This soap is provided for you as an example.
Chlorine tablets for water purification	24 strips (one strip contains 10 tablets)	It is highly recommended to use tap water in meat vendor shop for practices involving contact with meat. If tap water is not available, it is recommended to purify using water purification techniques such as using chlorine tablets. We are giving you chlorine tablet for water disinfection. One tablet is enough for 20L of water. For more information, see the pamphlet provided to you how to use chlorine tablets to disinfect water.
Hypochlorous acid (ZOE SAFE® from Paraclete Trading PLC, Addis Ababa, Ethiopia) for sanitizing work surfaces	2 bottles	Various substances which are safe for human health can be used for sanitizing meat contact surfaces. This material is used to disinfect surfaces after cleaning with soapy water. For more information, read the pamphlet provided to you describing how to use Zoe safe for cleaning work surfaces.
Hypochlorous acid (ZOE SAFE® from Paraclete Trading PLC, Addis Ababa, Ethiopia)	2 bottles	Various substance which are safe for human health can be directly sprayed on meat to decontaminate meat surfaces. This should be emphasized as it reduces bacterial load that comes outside of the meat shops such as abattoir contamination. For more information, read the pamphlet provided to you describing how to use Zoe safe for decontaminating meat surfaces.

for sanitizing/ decontaminating meat surfaces (beef carcasses)		
Foot operated dust bin with tight lid	1 piece	We highly recommend using separate containers for liquid and solid waste materials. This dustbin is used to store solid waste materials. It is highly recommended to use a foot operated dustbin. This helps to reduce hand contamination when opening.
Fingernail clippers	1 pack	It is always good to keep nails short. Dirty materials can be deposited under fingernails, and those dirty things are not easy to remove when washing hands. These dirty materials can harbour harmful germs. Having clip nails and keeping them at an accessible place encourages frequent nail clipping. This pack of nail clippers is a gift, and you may share among people who work closely with meat handling.
Oxfam washing station (1 piece), only those instructed	1 piece	Install this handwashing station according to the manual (with help of people accompanying you). We have provided this washing station because the washing station you already have is substandard or not to the required level to prevent cross-contamination.

Supplementary material 3. Scorecards for food safety inspection of butcher shops

This is a scorecard provided to butcher shops based on their score of compliance with food hygiene standards.

- No star (score <50): warning of closure.
- One red star (50 ≤ score <65): urgent hygiene improvement is required.
- Two yellow stars (65 ≤ score <75): hygiene standards are good.
- Three green stars (≥75): hygiene standards are very good.



Supplementary material 4. Sample types for detecting *E. coli* and their sampling techniques

Sample type	Sampling technique
Meat cutting boards	• Sample the cutting board as you find it (could be recently cleaned or just used). • Swab 10 x10 cm area of cutting board where cutting meat is mostly done (often in the middle of the board).
Meat hanging boards	• Move meat away from board and swab 10 X 10 cm area if possible. If getting 10 x10 cm area may not apply, then swab sufficient surface area to collect a representative sample.
Meat handlers' hands	• Ask meat cutter to swab his hand. • If right-handed, sample left hand. • If left-handed, sample right hand. • Swab the entire area of relevant hand palm including inner fingers.
Beef carcass surfaces	• Swab 10 x10 cm area if possible. If getting 10 x10 cm area may not be possible swab sufficient surface area to collect a representative sample. Any surfaces of meat can be swabbed for sampling but prioritise to collect carcass surfaces which often used to prepare traditional raw beef-based dishes (such as <i>tire siga/kurt</i>, <i>kitfo</i>, etc.). • Ask the meat cutters of the butcher shop to show you where they cut for raw meat such as <i>kurt</i>.
Water samples	• Sample 250 mL of water used for routine activities in a sterile bottle. Notice to identify the right water sources used for routine activities in the shop as shops may point to tap water where clients wash hands, but this may not be the source of water for routine activities. Ask the workers of the shop to show you water routinely used in the shop for cleaning and related activities. Follow aseptic procedures while collecting the water samples as indicated in the water sample collection techniques.

Supplementary material 5. Questionnaire to assess meat handlers' food safety knowledge and practices for the RCT food safety intervention

Item ID	Questions/Items	Choices/answers
Module 0. Basic information		
MA_Q4	1. Sub-city	
MA_Q5	2. Woreda	
meatshop_ID	3. Name of the Meat shop	
MV_IDa	4. Confirm Meat shop ID [meatshop_ID] is correct	1 Yes 2 No
Module A. Pre-interview information and shop identification		
MA_Q3	6. Interviewer name?	
MA_open	1. Is the meat shop identified by the pre-loaded GPS information or telephone number?	1 Yes, function as meat shop 2 Yes, moved but within the same area 3 Yes, but currently is not function as meat shop 4 Yes, but the shop is demolished 5 No, can't confirm as the area is not accessible 6 No, both GPS and phone number are wrong
Module B. Observation of meat handlers' activities from distant		

MB_Q1	2. <i>Note to enumerators: Doing your best not to be noticed, observe the butcher shop until two customers complete purchases at the shop, or 10 minutes, whichever is longer. Confirm the time you start waiting for someone to come. Time stamp. Start time</i>	
Obs_time1	2a. Please confirm the date and time 2024-Oct-15 07:38:29 is correct. If it is incorrect go back to Q2 and enter correct date and time. If the error is persistent go to the tablet date and time setting and adjust it.	1 Yes 2 No
MB_Q2	3. OBSERVE: How is money handled?	1 Same person who cuts meat handles money 2 Different persons handle meat and money 3 Did not observe transaction
MB_Q3	4. OBSERVE Does the worker wash or sanitize his/her hands between handling meat and money?	1 Washes hands 2 Sanitizes hands 3 Both washes and sanitizes hands 4 Neither washes nor sanitizes hands 5 Unable to observe
MB_Q4	5. OBSERVE Does the worker wash or sanitize his/her hands at any time while you observe?	1 Washes hands 2 Sanitizes hands 3 Both washes and sanitizes hands

		4 Neither washes nor sanitizes hands 5 Unable to observe
MB_Q5	6. OBSERVE Does the worker wipe the cutting board while you observe?	1 Yes 2 No
MB_Q6	7. OBSERVE Does the worker wash the cutting board while you observe?	1 Yes 2 No
MB_Q7	8. OBSERVE Does the worker sanitize the cutting board while you observe?	1 Yes 2 No
MB_Q8	9. OBSERVE How many customers bought meat while you watched?	
MB_Q9	10. Confirm the end time of the observation. Time Stamp. End time <i>Note to enumerators: please wait for at least one customer buy meat</i>	
Module C. Meat handlers' sociodemographic characteristics		
<i>Note</i>	<i>Note to enumerators: For this part of the interview, I would like to speak with the meat handler (cutter) please about his daily work. If possible, I would like to speak with him alone. After this section, I will have some questions for the manager about the business.</i>	
Consent provided		1 Yes 2 No
Consent not provided	Reason for declining participation from the survey	1 Not interested

		2 Didn't get permission from the manager/owner 3 Busy with work 4 Didn't want to disclose the reason 5 Took appointment to come back another time
MC_Q1	1. ASK Responsibilities of the respondent (select all that apply)	1 Cuts meat 2 Handles money 3 Cleans the shop 4 Manages the shop 5 Other, specify 88 Refuse
MC_Q1oth	1. Other Specify: Responsibilities of the respondent	
MC_Q2	2. ASK: Name of respondent?	
MC_Q4	4. Years working in a butcher shop business? <i>Note to enumerators: Not necessarily in the current meat shop, enter 0 if has not completed a full year.</i>	
MC_Q5	5. sex of the worker?	1 Male 2 Female
MC_Q6	6. How old are you (in years)? (in completed year)	

MC_Q7 (	7. What is the highest level of education you have completed?	1 None 2 Adult education only 3 Some primary (1-8 grades) 4 Completed primary 5 Some secondary (9-12 grades) 6 Completed secondary 7 Some college level 8 Completed diploma 9 Some degree level 88 Refuse
Phone number	8. Phone number of the butcher shop owner	
<i>Note</i>	<i>Note to enumerators: Put thermometer in fridge or freezer if one is present and turned on.</i>	
Module D. Meat handlers' food safety practices		
<i>Note</i>	<i>Note to enumerators: This section contains questions about food safety and hygiene measures practiced by the meat handlers and the butcher shops. Most of these questions are to be answered by observation, but there are cases where you have to ask the meat handler. Please pay attention to each while you proceed.</i>	
MD_Q1	1. ASK/OBSERVE: Which is true about the butcher shop? (Tick all that apply)	1 Sells raw meat for consumption at home

		2 Serves raw meat for consumption on its premises 3 Serves other food on its premises 4 Serve beverages on its premise
MD_Q2	2. Clean hands and clean clothes: OBSERVE DISCRETELY: Cleanliness of the meat seller (handler) being interviewed:	
MD_Q2a	2a. OBSERVE Are hands of meat handler clean? NOTE: hands with fresh blood may be considered clean	1 Yes 2 No
MD_Q2b	2b. OBSERVE Trimmed fingernails	1 Yes 2 No
MD_Q2c	2c. OBSERVE Cuts or wounds on hands	1 Yes 2 No
MD_Q2d	2d. OBSERVE Wounds on hands are covered	1 Yes 2 No
MD_Q3a	3a. OBSERVE Gown worn by respondent?	1 Yes 2 No
MD_Q3b	3b. OBSERVE White gowns are worn by respondent?	1 Yes 2 No
MD_Q3c	3c. OBSERVE Gown has outside pockets	1 Yes 2 No

MD_Q4	4. OBSERVE How clean is the gown worn by the worker?	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Clean
MD_Q5	5. ASK Do you own your own work gown, or is it provided by your employer?	1 Provided by employer 2 I own it 3 Other, specify 88 Refuse
MD_Q5oth	5. Do you own your own work gown, or is it provided by your employer? Other Specify	
MD_Q6	6. Ask Why are you not wearing a gown? (Do not read responses, select the one that best reflects the response)	1 I don't have one / shop does not provide 2 They are being washed today 3 There are not enough for all of us to wear 4 Other, specify 88 Refuse
MD_Q6oth	6. Why are you not wearing a gown? Other Specify	
MD_Q7	7. ASK: For how many days do you normally wear a gown between washings?	1 Less than a day 2 One day

		3 2-3 days 4 4-7 days 5 Other, specify 88 Refuse
MD_Q7oth	7. ASK: For how many days do you normally wear a gown between washings? Other Specify	
MD_Q8	8. OBSERVE Is the respondent wearing hairnet?	1 Yes 2 No
MD_Q9a	9. ASK : Is the worker able to show you towels of different colours for different purposes? (example, green for clean, red for dirt, etc.)?	1 Yes 2 No
MD_Q10	10. OBSERVE : Are towels of different colours used for different purposes (example, green for clean, red for dirt, etc.)?	1 Yes 2 No
MD_Q11	11. ASK : Is the water used in the shop treated in any way?	1 Yes 2 No
MD_Q12	12. ASK/OBSERVE : What is used for treating water? (Tick all that apply)	1 Boiling 2 Filtration 3 Wuha agar 4 Bishan gari 5 Chlorine solution/tab

		6 Other (Specify) 88 Refuse
MD_Q12oth	12. Water treatment Other Specify	
MD_Q12a	12a. ASK: Could you please show me the device or product you use to treat water? Is the respondent able to show you a filter or treatment product?	1 Yes 2 No
MD_Q12image	12image. Take picture/photo <i>Take a photo of the water treatment product or device</i>	
MD_Q13note	13. OBSERVE : Meat appearance (Select which apply to pieces of meat or carcasses): <i>Module D: Clean surfaces</i>	
MD_Q14	14. Most of pieces of meat or carcasses are:	1 Bright red 2 Brownish 3 Darker 4 Other (Specify)
MD_Q14oth	14. Colour Other Specify	
MD_Q15	15. Any pieces of meat or carcasses are:	1 Bright red 2 Brownish 3 Darker 4 Other (Specify)
MD_Q15oth	15. Colour Other Specify	

MD_Q16	16.Marbling (intramuscular fat within the muscle and between the muscle fibres which appears as fine flecks of fat within a muscle)	1 Abundant 2 Slightly abundant 3 Small 4 None
MD_Q17note	17note. OBSERVE: What material is the meat on display in contact with?	
MD_Q17	17.Hook	1 Wooden (unpainted) 2 Wooden (painted) 3 Metal 4 None 5 Other, Specify
MD_Q17oth	17.Hook. Other Specify	
MD_Q18	18. Meat hanging board	1 Wooden (unpainted) 2 Wooden (painted) 3 Metal 4 None 5 Other, Specify
MD_Q18oth	18.Meat hanging board. Other Specify	
MD_Q19	19.Wall	1 In contact

		2 Not in contact
MD_Q19a	19a. OBSERVE: Cleanliness of the surfaces (meat hanging board, wall and hook) which meat is in contact with (refer to photos)	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Clean
MD_Q19image	19a. Take picture/photo <i>Take a photo of the meat and the meat hanging board</i>	
MD_Q20	20. OBSERVE: Which type of meat cutting board is in use?	1 Wooden board 2 Plastic board 3 Metal board 4 Marble (granite, other stone) board 5 Other, specify
MD_Q20oth (<i>required</i>)	20. OBSERVE: Which type of meat cutting board is in use? Other Specify	
MD_Q21	21. OBSERVE: What is the colour of the meat cutting board in use?	1 White 2 Red 3 Wooden colour 4 Other, specify
MD_Q21oth	21. OBSERVE: What is the colour of the meat cutting board in use? Other Specify	

MD_Q22	22. OBSERVE: Cleanliness of meat cutting board (enumerator: refer to photos)?	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Clean
MD_Q22a	22a. OBSERVE: How smooth is the meat cutting board? (enumerator: Refer to photos)	1 Very smooth 2 Mostly smooth but with some cuts / grooves 3 Many cuts / grooves and/or very rough
MD_Q22bimage	22b. Take picture/photo of the meat cutting board <i>Take picture/photo of the meat cutting board</i>	
MD_Q23 (	23. OBSERVE: How clean is the meat chopping block/log?	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Clean 5 No chopping block observed
MD_Q23a	23a. OBSERVE: How smooth is the meat chopping block/log?	1 Very smooth 2 Mostly smooth but with some cuts / grooves 3 Many cuts / grooves and/or very rough

		4 No chopping block observed
MD_Q23image	23image. Take picture/photo <i>Take a photo of the chopping block/log</i>	
MD_Q23b	23b. OBSERVE: Who is currently participating in the survey?	1 Worker alone 2 Worker with manager help 3 Worker with other help
MD_Q23c	23c. ASK: When do you normally wash the chopping block/log? (do not read responses, select all that apply)	1 at the end of the day 2 at the start of the day 3 several times throughout the day 4 at least once a week 5 less than once a week 6 do not normally wash 88 Refuse
MD_Q24	24. ASK or OBSERVE: Is stomach sold by this shop? (If you see some for sale, indicate “yes”, if not, ask the respondent)	1 Yes 2 No
MD_Q25	25. ASK: Does the vendor ever cut stomach	1 Yes 2 No
MD_Q25a	25a. ASK: Does the vendor ever grind stomach	1 Yes 2 No

MD_Q25b	25b. Separate: OBSERVE: If present, is stomach stored or kept separate from fresh meat? Observe if stomach is currently present, if not present, ask worker where stomach is stored.	1 In a separate place from meat (not in contact, and stomach is not hung above the meat) (OBSERVED) 2 Same place as meat (in contact, or stomach is above meat) (OBSERVED) 3 In a separate place from meat (not in contact, and stomach is not above meat) (REPORTED) 4 Same place as meat (in contact, or stomach is above meat) (REPORTED) 88 Refuse
MD_Q26	26. OBSERVE: Is a different cutting board used for stomach?	1 Yes 2 No
MD_Q27	27. OBSERVE: Cleanliness of stomach cutting board	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Very Clean
MD_Q28	28. OBSERVE: How smooth is the stomach cutting board?	1 Very smooth

		2 Mostly smooth but with some cuts / grooves 3 Many cuts / grooves and/or very rough
MD_Q28a	28a. ASK: At what point or points during your workday do you normally wash your cutting board or boards? (do not read responses, select all that apply)	1 at the end of the day 2 at the start of the day 3 between uses for stomach and meat 4 several times throughout the day 5 do not normally wash 88 Refuse
MD_Q28b	28b. OBSERVE: Who responded to the question you just asked?	1 Worker alone 2 Worker with manager help 3 Worker with other help
MD_Q29	29. OBSERVE: Cleanliness of butcher shop wall	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Clean
MD_Q29image	29. Take picture/photo <i>Take a photo of the meat shop wall</i>	

MD_Q30	30. OBSERVE: Cleanliness of butcher shop floor (enumerator: refer to photos)	1 Very dirty 2 Somewhat dirty 3 Mostly clean 4 Clean
MD_Q30image	30. Take picture/photo <i>Take a photo of the meat shop floor</i>	
MD_Q31	31. OBSERVE: Butcher shop has sufficient lighting (to see well the colour of meat)?	1 Yes 2 No
MD_Q32	32. Safe storage: OBSERVE/Ask: Is a functional refrigerator present?	1 Yes 2 No
MD_Q33	33.Is electrical power supply available at the time of the current interview?	1 Yes 2 No
MD_Q34	34. OBSERVE: Is the fridge turned on?	1 Yes 2 No
MD_Q35	35. OBSERVE: Is there meat in the fridge?	1 Yes 2 No 88 Refuse
MD_Q36	36. OBSERVE: Use your thermometer to check: what is the fridge temperature? °C	
MD_Q36image	36image. Take picture/photo <i>Take a photo of the fridge with thermometer</i>	

MD_Q37	37. OBSERVE : Is a freezer present (either as part of the fridge or separately)?	1 Yes 2 No
MD_Q38	38. OBSERVE : Is the freezer turned on?	1 Yes 2 No
MD_Q39	39. OBSERVE : Is there meat in the freezer?	1 Yes 2 No
MD_Q39a	39a. OBSERVE : Is the meat frozen hard?	1 Yes 2 No
MD_Q40	40. OBSERVE : What is the freezer temperature? °C	
MD_Q40image	40image. Take picture/photo <i>Take a photo of the freezer with thermometer</i>	
MD_Q41	41. OBSERVE : Is there meat stored outside of the fridge or freezer, other than which will be used for raw consumption (such as tere <i>siga</i> or <i>kitfo</i>)?	1 Yes 2 No
MD_Q42	42. OBSERVE : Flies on meat (Select which apply)	1 None 2 Fewer than 5 3 Between 5 and 20 4 More than 20
MD_Q43a	43a. Ask/OBSERVE : are any fly control technologies present? Select all that you see.	1 Fly trap 2 Chira

		3 Nonelectric fly swatter 4 Electric fly swatter 5 Smoke repellent 6 Electric repellent device 7 Chemical repellent 8 Fan 9 wrap in plastic sheet 10 None observed 11 Other, specify 88 Refuse
MD_Q43aoth	43a.ASK: Fly control technologies? Other Specify	
MD_Q43b	43b.ASK: Do you use the plastic wrap to cover meat or hanging board?	1 Yes, to cover meat 2 Yes, to cover hanging board 3 Yes, both 4 Other, specify 88 Refuse 99 Don't know
MD_Q43both	43b. ASK: use of plastic wrap, Other Specify	

MD_Q44	44. OBSERVE : Which is true about this meat shop regarding solid waste management?	1 There is no container for solid waste 2 The same container is used for solid and liquid waste 3 It has a separate container for solid waste 4 Unable to observe
MD_Q45a	45a. OBSERVE : Is there a cover on the container in which waste is kept?	1 Yes, and it is on tightly 2 Yes, but it is not on tightly 3 No 4 Unable to observe
MD_Q45b	45b. OBSERVE : Is the lid is pedal-operated?	1 Yes 2 No 3 Unable to observe
MD_Q46	46. Observe : Which is true about this meat shop regarding liquid waste management?	1 Liquide waste goes into the sewerage system 2 Liquide waste goes into a container with cracks or hole 3 Liquide waste goes into a container without cracks or hole 4 wastes are dump on the floor

MD_Q47a	47a. OBSERVE: Is there a cover on the container in which liquid waste is kept?	1 Yes, and it is on tightly 2 Yes, but it is not on tightly 3 No 4 Unable to observe
MD_Q47b	47b. OBSERVE: Is the lid is pedal-operated?	1 Yes 2 No 88 Refuse
MD_Q47image	47image. Take picture/photo <i>Take a photo of main waste disposal</i>	
MD_Q48a	48a. Sanitise ASK: Is the meat at this shop sprayed to combat contamination (sanitization)?	1 Yes 2 No 88 Refuse
MD_Q49	49. ASK/Observe: what is used for sanitizing meat? Could you show it to me, please?	1 Citric acid 2 Acetic acid (vinegar) 3 Chlorine solution/bleach such as Berekina 4 Alcohol solution 5 Zoe safe 6 Unable to observe 7 Other, specify

MD_Q49oth	49. ASK: What is used for sanitising meat? Other Specify	
MD_Q49a <i>(required)</i>	49a. Observe: Was the respondent able to quickly find a bottle with sanitizer in it?	1 Yes, respondent quickly found sanitizer 2 Respondent had a hard time locating sanitizer 3 Respondent was unable to show sanitizer 4 Respondent found sanitizer but bottle was empty
MD_Q49b	49b. Observe: Is the respondent able to show you any empty sanitizer bottles?	1 Yes, 2 or fewer bottles 2 Yes, between 3 and 10 bottles 3 Yes, more than 10 bottles 4 No
MD_Q49image	49image. Take picture/photo <i>Take a photo of all the sanitizer bottles you see</i>	
MD_Q50	50. ASK: Are surfaces (meat cutting board, meat hanging boards, meat chopping logs or knives in the shop sprayed to combat contamination (disinfection)?	1 Yes 2 No 88 Refuse
MD_Q51	51. ASK/OBSERVE: What is used to disinfect surfaces? Could you show it to me, please?	1 Citric acid 2 Acetic acid (vinegar)

		3 Chlorine solution/bleach such as Berekina 4 Alcohol solution 5 Zoe safe 6 Unable to observe 7 Other, specify
MD_Q51oth	51. ASK: What is used to disinfect surfaces? Other Specify	
MD_Q51a	51a. Observe: Was the respondent able to quickly find a bottle with disinfectant in it?	1 Yes, respondent quickly found sanitizer 2 Respondent had a hard time locating sanitizer 3 Respondent was unable to show sanitizer 4 Respondent found sanitizer but bottle was empty
MD_Q52	52. ASK Who is mostly responsible for disinfecting the shop surfaces?	1 Myself 2 Shop owner 3 Shop manager 4 Other woman 5 Other man

		88 Refuse
MD_Q52a	52a. ASK Who is mostly responsible for sanitizing the meat?	1 Myself 2 Shop owner 3 Shop manager 4 Other woman 5 Other man 88 Refuse
MD_Q53	53. ASK: Do you use a chemical to combat contamination on your hands (hand sanitization)?	1 Yes 2 No 88 Refuse
MD_Q54	54. ASK: What is used for sanitising hands?	1 Citric acid 2 Acetic acid (vinegar) 3 Chlorine solution 4 Alcohol solution 5 Gel sanitizer 6 Zoe safe 7 Other, specify 88 Refuse

MD_Q54oth	54. What is used for sanitising hands? Other Specify	
MD_Q54image	54. Take picture/photo of sanitizers and disinfectants <i>Take a photo of all of the disinfectants and sanitizers used on surfaces and hands</i>	
MD_Q55	55. Safe sourcing: OBSERVE: Is a legal stamp from the abattoir present on the meat, or can the respondent show you a receipt from the abattoir for today's meat?	1 Yes 2 No
MD_Q56	56. ASK: What steps should meat sellers follow during cleaning work surfaces? (Do not read responses, select all that respondent mentions)	1 Scrape or remove food or debris from the surfaces Wash the surfaces with hot 2 water and detergents such as soap Wash the surface with cold or 3 warm water and detrgent such as soap 4 Rinse the surfaces with water Disinfect or sanitize the 5 surfaces with appropriate chemicals such as chlorine solution (Berekina, etc.) 6 Allow the surface to air dry 7 None of the above 88 Refuse
MD_Q57	57. ASK: Deep cleaning:	1 Yes

	Is the butcher shop regularly deep cleaned? (that is cleaning involving all parts of the shop such as floors, walls, doors, windows, ceilings, tools and equipment [cutting board, hanging board, chopping blocks/logs, hooks, knives, grinders, tables, etc] and even the environment surrounding the shop)?	2 No 88 Refuse
MD_Q58	58. ASK: How often is the deep cleaning done?	1 Daily 2 Twice weekly 3 Weekly 4 Once every 2 weeks 5 Monthly 6 Less than monthly 88 Refuse
MD_Q59	59. ASK: How many times per day do you normally wash your hands during working hours?	
MD_Q60	60. ASK: When did you last have a gastro-intestinal illness? (Symptoms of diarrhoea and/or vomiting)	1 Within the past week 2 Within the past month 3 Within the past year 4 More than a year ago 88 Refuse
MD_Q61	61. ASK: Do you normally stay home from work when you have symptoms of diarrhoea and/or vomiting?	1 Yes, always 2 only if symptoms are bad

		3 No 88 Refuse
MD_Q61a	61a. ASK: Are you paid for days when you stay home from work because of you are ill?	1 Yes 2 No
MD_Q62-68note	Next, I will ask you a few questions about meat cutting and grinding equipment	
MD_Q62	62. ASK/OBSERVE: Do you have separate knives for cutting meat and stomach? <i>(only indicate yes if the respondent shows you two or more knives)</i>	1 Yes 2 No 3 Unable to observe
MD_Q63	63. ASK: At what point or points during your workday do you normally wash your knife? <i>(do not read responses, select all that apply)</i>	1 At the end of the day 2 At the start of the day 3 Between uses for stomach and meat 4 Several times throughout the day 5 Weekly 6 Once every 2 weeks 7 Do not normally wash 88 Refuse
MD_Q64	64. ASK: At what point or points during your workday do you normally wash your knife sharpening file?	1 At the end of the day

	<i>(do not read responses, select all that reply)</i>	2 At the start of the day 3 Between uses for stomach and meat 4 Several times throughout the day 5 Weekly 6 Once every 2 weeks 7 Do not normally wash 88 Refuse
MD_Q65	65. ASK: Does the shop have a meat grinder?	1 Yes 2 No 88 Refuse
MD_Q66	66. ASK: Do you use the same grinder for stomach and meat? <i>(only select no if you are able to see two grinders)</i>	1 Yes 2 No 3 Stomach is not grounded in this shop 88 Refuse
MD_Q67	67. ASK: At what point or points during the day do you wash the grinder? <i>(do not read responses, select all that apply) add responses, select all that apply</i>	1 At the end of the day 2 At the start of the day

		3 Between uses for stomach and meat 4 Several times throughout the day 5 Weekly 6 Once every 2 weeks 7 Do not normally wash 88 Refuse
MD_Q67a	67a. OBSERVE: Who responded to the question you just asked?	1 Worker alone 2 Worker with manager help 3 Worker with other help
MF_Q20	36. Hand washing: ASK or OBSERVE: I would like to see where you wash your hands. Would you be able to take me to that place, please? [For enumerator Are you able to see the handwashing place?]	1 Yes 2 No 88 Refuse
MF_Q21	37. ASK: Approximately how far in meters is the handwashing place from the meat cutting place? (If immediately next to the meat cutting place, indicate zero).	
MF_Q22	38. OBSERVE: What type of handwashing facility is it?	1 Jerrycan or bucket 2 Modern tap (piped connection with running water) 3 Tank with spigot (e.g., roto)

		Other set-up that provides 4 flowing water (tip bucket with string or lever) 5 Other specify 88 Refuse
MF_Q22oth	38. Oth. ASK: What type of handwashing facility is it? Other Specify	
MF_Q23	39. OBSERVE: Ask the worker to show you how they wash their hands. Select all the practices you see.	1 Wet hands with water 2 Apply enough soap to cover all hand surfaces 3 Rub hands palm to palm 4 Scrub hands for at least 20 seconds 5 Wash between fingers palm to palm. 6 Washes between fingers and backs of hands 7 Uses nailbrush or picks dirt out of nails 8 Wash fingertips 9 Puts hand into water source (if bucket is used)

		10 Unable to observe
MF_Q24	40. OBSERVE: Which of the following tools are available at the handwashing station? (Select all that apply)	1 Water 2 Warm water 3 Soap 4 Clean towels or disposable paper towels 5 A mirror 6 Messages/instructions to motivate hand washing 7 Arrows leading to the hand washing station 8 None of the above 9 Unable to observe 10 Other specify
MF_Q24oth	40. Oth. ASK: Other specify	
MF_Q26	41. OBSERVE: Is the handwashing station placed where customers can see it?	1 Yes 2 No 3 Unable to observe
MF_Q42image	42. Take picture/photo <i>Take a photo of hand wash facility</i>	

Module E. Meat handlers' food safety knowledge		
Note	<i>Next, I will ask you a few questions about food safety knowledge and if you have got any training on food safety.</i> Note for enumerators: Don't record the manager or other person training attendance information if manger or other person is participating in meat handlers interview.	
ME_Q1	1. ASK: Have you ever received training in food safety?	1 Yes 2 No 88 Refuse
ME_Q2	2. ASK: When was the last time you received food safety training?	1 Within the past month 2 Within the past 3 months 3 Within the past 6 months 4 Within the past year 5 Within the past 5 years 6 More than 5 years ago 88 Refuse
ME_Q2a	2a. ASK: Can you please show me the certificate of the most recent training you attended?	1 Able to see the certificate 2 Not able to see the certificate 88 Refuse
ME_Q3	3. ASK: How many hours was the last training in total (add up if training ran for multiple days)? Total hours	

ME_Q4	4. ASK: What are some rules or good hygiene practices you learned in the training? <i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>	1 Clean water 2 Clean food contact surfaces 3 Clean hands 4 Clean cloths / clothes 5 Clean tools 6 Separate 7 Sequence (first in first out) 8 Safe storage 9 Sanitize 10 Other specify 99 Don't know
ME_Q4oth	4. ASK: What are some rules or recommended practices you learned in the training? Other Specify	
ME_Q5note	<i>Note: Now, I will show some pictures from this tablet and ask you whether what you see in the photo is a recommended practice (proper food safety practices).</i>	
ME_Q5a	5a. Storing raw meat with other foods, Is this a good practice for food safety?	1 Yes 2 No 99 Don't know
ME_Q5agood	5a_g. What is good about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>	1 Cold storage

		2 Separation of meat and other foods 3 Other (specify) 88 Refuse
ME_Q5agoth	5a_goth. ASK: What are other good practices? Other Specify	
ME_Q5abad	5a_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>	1 Fridge is dirty 2 Storing meat together with other foods 3 Other (specify) 88 Refuse
ME_Q5aboth	5a_both. ASK: What are other bad practices? Other Specify	
ME_Q5b	5b. Raw meat and stomach hanged together in contact, Is this a good practice for food safety? <i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>	1 Yes 2 No 99 Don't know
ME_Q5bgood	5b_g. What is good about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>	1 Meat is hanging 2 Meat hanging board is of appropriate material 3 Meat hanging board is clean 4 Other specify 88 Refuse

ME_Q5bgoth	5b_goth. ASK: What are good practices? Other Specify	
ME_Q5bbad	5b_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Meat is hanging in contact with stomach 2 Meat and stomach is hanging at equal level 3 Other specify 88 Refuse
ME_Q5bboth	5b_both. ASK What are bad practices? Other Specify	
ME_Q5c	5c. Materials are scattered haphazardly and not clean, Is this a good practice for food safety?	1 Yes 2 No 99 Don't know
ME_Q5cgood	5c_g. ASK: What is good about these practices?	
ME_Q5cbad	5c_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Dried blood stains on the board 2 Board has crack/grooves and rough surface 3 Materials are scattered haphazardly and dirty 4 Other specify 88 Refuse
ME_Q5cboth	5c_both. ASK What are bad practices? Other Specify	

ME_Q5d	5d. Incomplete surface cleaning], Is this a good practice for food safety?	1 Yes 2 No 99 Don't know
ME_Q5dgood	5d_g. ASK What is good about this practice?	
ME_Q5dbad	5d_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Board has rough surface 2 Board has crack/grooves 3 Leftover meat on the cutting board 4 knives are dirty and left on the cutting board 5 Other specify 88 Refuse
ME_Q5dboth	5d_both. ASK What are bad practices? Other Specify	
ME_Q5e	5e. Complete cleaning practices], Is this a good practice for food safety?	1 Yes 2 No 99 Don't know
ME_Q5egood	5e_g. What is good about this practice? NOTE: Do not read responses. Select all mentioned by respondent	1 Clean knife 2 Clean cutting surface 3 Wooden cutting surface

		4 Other specify 88 Refuse
ME_Q5egoth	5e_goth. ASK What are good practices? Other Specify	
ME_Q5ebad	5e_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Dirty knife 2 Dirty cutting surface 3 Other specify 88 Refuse
ME_Q5eboth	5e_both. ASK What are bad practices? Other Specify	
ME_Q5f	5f. Washing hands in a bucket (bad practice which re-contaminates the water in the bucket)], Is this a good practice for food safety?	1 Yes 2 No 99 Don't know
ME_Q5fgood	5f_g. What is good about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Clean knife 2 Clean cutting surface 3 Plastic cutting surface 4 Other (specify) 88 Refuse
ME_Q5fgoth	5f_goth. ASK What are good practices? Other Specify	
ME_Q5fbad	5f_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Dirty knife

		2 Dirty cutting surface 3 Other specify 88 Refuse
ME_Q5fboth	5f_both. ASK What are bad practices? Other Specify	
ME_Q5g	5g. Washing hands with clean tap water, is this a good practice for food safety?	1 Yes 2 No 99 Don't know
ME_Q5ggood	5g_g. What is good about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Washing hands 2 Using soap 5 Other specify 88 Refuse
ME_Q5ggoth	5g_goth. ASK What are good practices? Other Specify	
ME_Q5gbad	5g_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Dipping hands directly in a bucket while washing hands 2 Soap has gotten in the water 4 Other specify 88 Refuse
ME_Q5gboth	5g_both. ASK What are bad practices? Other Specify	
ME_Q5h		1 Yes

	5h. Washing hands with clean tap water, is this a good practice for food safety?	2 No 99 Don't know
ME_Q5hgood	5h_g. What is good about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Washing hands 2 Washing hands with soap 3 Using a tap water 4 Other specify 88 Refuse
ME_Q5hgoth	5h_goth. ASK What are good practices? Other Specify	
ME_Q5hbad	5h_b. What is bad about this practice? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Not using soap 2 Other specify 88 Refuse
ME_Q5hboth	5h_both. ASK What are bad practices? Other Specify	
ME_Q7	7. ASK: Can you tell if food is safe based on its physical qualities (for example its smell or taste or look)	1 Yes 2 No 3 Sometimes 99 Don't know 88 Refuse
ME_Q9	8. ASK: At what point or points do germs usually get onto meat? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 During slaughter

		2 During transport 3 At the shop 4 After sale to the customer 5 On farm 6 None of the above mentioned 7 Other specify 88 Refuse
MF_Q9oth	8. Oth. Points do germs usually get onto meat, Other Specify	
ME_Q13	9. ASK: When you get new meat before you finish the old one, how do you manage meat storage and sale? NOTE: do not read responses. Select all that the respondent mentions <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Newly received meats kept separate from old meats Old meats preferred to be sold 2 prior to starting to sell newly received meats 3 Old meats hung at the front or more accessible board part 99 Don't know 88 Refuse
ME_Q14	10.ASK: What are the symptoms of foodborne diseases you know? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Diarrhoea 2 Stomach pain 3 Vomiting

		4 Fever 5 Headache 6 Fatigue 7 Tapeworm seen in the stool 8 Other specify 88 Refuse
ME_Q14oth	10. Oth. ASK: What are the symptoms of foodborne diseases you know? Other Specify	
ME_Q14a	11. ASK: What practices should meat sellers follow to ensure the meat they sell is safe? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Use clean cutting surfaces (boards / logs) 2 Disinfect cutting / contact surfaces 3 Use clean tools (knives/grinder/axe) 4 Keep hands clean 5 Store meat and stomach separately 6 Store meat in refrigerator or freezer 7 Sanitize/spray meat 8 Wear clean white coat

		9 Use clean water 10 Use clean towels/cloths 11 Use different towels/cloths for different purposes 12 Keep flies off meat 13 Sell oldest meat first 14 Other specify 15 None of the above mentioned 88 Refuse 99 Don't know
ME_Q14a.oth	11. Oth. ASK: Practices should meat sellers follow to ensure the meat is safe? Other Specify	
ME_Q15	12.ASK: When is it important to wash your hands while at work? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Before commencing or recommencing work 2 At some intervals between raw meat handlings 3 Between handling stomach and raw meat 4 After using a toilet After handling non-food items 5 such as cash, garbage, shaking hands, etc.

		6 After sneezing, smoking, eating or touching face 7 None of the above mentioned 88 Refuse
ME_Q16	13.OBSERVE: Who responded to the knowledge questions you just asked?	1 Worker alone 2 Worker with manager help 3 Worker with other help
ME_Q17	14. Ask: Are you the one who provided hand palm swab sample?	1 Yes 2 No 99 Don't know 88 Refuse
ME_Q18	15. What should meat sellers do to ensure hand hygiene to make meat safe? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Trimmed fingernails 2 Covered wounds on hand 3 Wash hands as required 4 Other specify 88 Refuse
ME_Q18oth	15. Oth. ASK: What meat sellers do to ensure hand hygiene to make meat safe? Other Specify	
ME_Q19	16. What clothing should meat sellers wear at work? (Note to enumerator: Do not read responses, select all mentioned by respondent)	1 Wear white gowns with outside pockets

	<i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	2 Wear white gowns without outside pockets 3 Wear any coloured gowns 4 Wear hairnets 5 None of the above mentioned 6 Other specify 88 Refuse
ME_Q19oth	16. Oth. ASK: Worksite clothing. Other Specify	
ME_Q20	17. What should meat sellers do to ensure the water they routinely use in their shops is safe?	1 Treat using appropriate methods such as chemicals 2 Store in a clean container with tight lids 3 Avoid putting hands in stored water such as water in buckets 4 Using water from safe sources 5 None of the above mentioned 6 Other specify 88 Refuse
ME_Q20oth	17. Oth. What should meat sellers do to ensure the water they routinely use in their shops is safe? Other Specify	

ME_Q21	18. Which food hazards do you know that can make meat unsafe? <i>Note for enumerators: do not read responses. Select all that the respondent mentions.</i>	1 Germs such as salmonella 2 Parasites such as tapeworm 3 Chemicals such as pesticide residues, antimicrobial residues 4 Physical hazards such as bones in meat 5 Other specify 88 Refuse
ME_Q21oth	18. Oth. ASK: Food hazards that can make meat unsafe? ? Other Specify	
gps_location (required)	43. Record the location of the residence <i>Before taking location make sure accuracy is <10m</i>	
MG thanks	Thank you for your time, we are finished with the interview.	

Supplementary material 6: Items domains for food safety knowledge questions

Note: For details of the items listed below, please refer to Supplementary Material 5 using the corresponding item IDs.

Items ID	Items	Choices/answers	Food safety knowledge domains
me_q15_1	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	Before commencing or recommencing work?	Hand hygiene
me_q15_2	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	At some intervals between raw meat handlings	
me_q15_3	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	Between handling stomach and raw meat	
me_q15_4	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	After using the toilet	
me_q15_5	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	After handling non-food items such as cash, garbage, shaking hands, etc.	
me_q15_6	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	After sneezing, smoking, eating or touching face.	
me_q15_88	When is it important to wash your hands while at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)	refuse	
me_q18_1	What should meat sellers do to ensure hand hygiene to make meat safe?	Trimmed fingernails	
me_q18_2	What should meat sellers do to ensure hand hygiene to make meat safe?	Covered wounds on hand	

me_q18_3	What should meat sellers do to ensure hand hygiene to make meat safe?	Wash hands as required	
me_q18_88	What should meat sellers do to ensure hand hygiene to make meat safe?	refused	
me_q5g	Is this good practice for food safety (washing hands under tape water)?	Yes/No	
me_q14a_4	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Keep hands clean	
me_q14a_8	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Wear clean white coat	Proper and clean clothing
me_q19_1	What clothing should meat sellers wear at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	Wear white gowns with outside pockets	
me_q19_2	What clothing should meat sellers wear at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	Wear white gowns without outside pockets	
me_q19_3	What clothing should meat sellers wear at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	Wear any coloured gowns	
me_q19_4	What clothing should meat sellers wear at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	wear hairnets	
me_q19_88	What clothing should meat sellers wear at work (<i>Note for enumerators: do not read responses. Select all that the respondent mentions</i>)?	refused	
me_q14a_9	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Use clean water	Keeping water clean
me_q20_1	What should meat sellers do to ensure the water they routinely use in their shops is safe?	Treat using appropriate methods such as chemicals	
me_q20_2	What should meat sellers do to ensure the water they routinely use in their shops is safe?	Store in a clean container with tight lids	

me_q20_3	What should meat sellers do to ensure the water they routinely use in their shops is safe?	Avoid putting hands in stored water such as water in buckets	
me_q20_4	What should meat sellers do to ensure the water they routinely use in their shops is safe?	Using water from safe sources	
me_q20_88	What should meat sellers do to ensure the water they routinely use in their shops is safe?	refused	
me_q5c	Is this a good practice for food safety (unwanted materials stored on cutting boards)?	Yes/No	Cleaning and disinfection of work surfaces
me_q5e	Is this a good practice for food safety (incompletely/poorly cleaned knife and cutting board)?	Yes/No	
me_q5f	Is this a good practice for food safety (completely/well cleaned knife and cutting board)?	Yes/No	
me_q14a_1	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Use clean cutting surfaces (boards / logs)	
me_q14a_2	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Disinfect cutting / contact surfaces	
me_q14a_3	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Use clean tools (knives/grinder/axe)	
me_q14a_10	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Use clean towels/cloths	
me_q14a_11	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Use different towels/cloths for different purposes?	Keeping meat safe
me_q14a_6	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Store meat in refrigerator or freezer	
me_q14a_7	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Sanitize/spray meat	
me_q14a_12	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Keep flies off meat	

me_q5a	Is this a good practice for food safety (storing raw meat with other foods)?	Yes/No	Preventing cross-contamination
me_q5b	Is this a good practice for food safety (raw meat and stomach in contact)?	Yes/No	
me_q13_3	When you get new meat before you finish the old one, how do you manage meat storage and sale <i>(Note for enumerators: do not read responses. Select all that the respondent mentions)?</i>	Old meats hung at the front or more accessible board part	
me_q13_88	When you get new meat before you finish the old one, how do you manage meat storage and sale <i>(Note for enumerators: do not read responses. Select all that the respondent mentions)?</i>	refused	
me_q13_99	When you get new meat before you finish the old one, how do you manage meat storage and sale <i>(Note for enumerators: do not read responses. Select all that the respondent mentions)?</i>	don't know	
me_q14a_13	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Sell oldest meat first	
me_q5h	Is this a good practice for food safety (washing hands by inserting in water stored in bucket)?	Yes/No	
me_q13_1	When you get new meat before you finish the old one, how do you manage meat storage and sale <i>(Note for enumerators: do not read responses. Select all that the respondent mentions)?</i>	Newly received meats kept separate from old meats	
me_q13_2	When you get new meat before you finish the old one, how do you manage meat storage and sale <i>(Note for enumerators: do not read responses. Select all that the respondent mentions)?</i>	Old meats preferred to be sold prior to starting to sell newly received meats	
me_q14a_5	ASK: What practices should meat sellers follow to ensure the meat they sell is safe?	Store meat and stomach separately	Foodborne diseases
me_q7	Can you tell if food is safe based on its physical qualities (for example its smell or taste or look)	Yes/No	
me_q9_1	At what point or points do germs usually get onto meat <i>(Note to enumerators: Read response options, select all that the respondent mentions)?</i>	During slaughter	
me_q9_2	At what point or points do germs usually get onto meat? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	During transport	
me_q9_3	At what point or point do germs usually get onto meat? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	At the shop	

me_q9_4	At what point or point do germs usually get onto meat? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	After sale to the customer	
me_q9_5	At what point or points do germs usually get onto meat? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	On farm	
me_q9_8	At what point or points do germs usually get onto meat? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	refuse	
me_q14_1	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	diarrhoea	
me_q14_2	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	stomach pain	
me_q14_3	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	vomiting	
me_q14_4	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	fever	
me_q14_5	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	headache	
me_q14_6	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	fatigue	
me_q14_7	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	tapeworm	
me_q14_88	What are the symptoms of foodborne diseases you know? <i>(Note to enumerators: Read response options, select all that the respondent mentions)</i>	refused	
me_q21_1	Which food hazards do you know that can make meat unsafe?	germs	
me_q21_2	Which food hazards do you know that can make meat unsafe?	parasites	

me_q21_3	Which food hazards do you know that can make meat unsafe?	chemicals	
me_q21_5	Which food hazards do you know that can make meat unsafe?	physical	
me_q21_88	Which food hazards do you know that can make meat unsafe?	refused	

Supplementary material 7: Items domains for food safety practice questions

Note: For details of the items listed below, please refer to Supplementary Material 5 using the corresponding item IDs.

Items ID	Items	Choices/answers	Food safety practice domains
Observed food safety practices			
mb_q3	4. OBSERVE Does the worker wash or sanitize his/her hands between handling meat and money?	Yes/No	Keeping hand hygiene
mb_q4	5. OBSERVE Does the worker wash or sanitize his/her hands at any time while you observe?	Yes/No	
md_q2c	2c. OBSERVE Cuts or wounds on hands	Yes/No	
md_q2d	2d. OBSERVE Wounds on hands are covered	Yes/No	
mf_q23_1	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Wet hands with water.	
mf_q23_2	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Apply enough soap to cover all hand surfaces	
mf_q23_3	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Rub hands palm to palm	
mf_q23_4	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Scrub hands for at least 20 seconds	
mf_q23_5	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Wash between fingers palm to palm	
mf_q23_6	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Washes between fingers and backs of hands	
mf_q23_7	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Washes between fingers and backs of hands	
mf_q23_8	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Wash fingertips	

mf_q23_9	39. OBSERVE: Ask the worker to show you how they wash their hands (Select all the practices you see)	Puts hand into water source (if bucket is used)	
md_q3a	3a. OBSERVE Gown worn by respondent?	Yes/No	Using proper and clean worksite clothing
md_q3b	3b. OBSERVE White gowns are worn by respondent?	Yes/No	
md_q3c	3c. OBSERVE Gown has outside pockets	Yes/No	
md_q4	4. OBSERVE How clean is the gown worn by the worker?	Clean/dirty	
md_q8	8.OBSERVE Is the respondent wearing hairnet?	Yes/No	
mb_q5	6. OBSERVE Does the worker wipe the cutting board while you observe?	Yes/No	Cleaning and disinfection of work surfaces
mb_q6	7. OBSERVE Does the worker wash the cutting board while you observe?	Yes/No	
mb_q7	8. OBSERVE Does the worker sanitize the cutting board while you observe?	Yes/No	
md_q10	10. OBSERVE: Are towels of different colours used for different purposes (example, green for clean, red for dirt, etc.)?	Yes/No	
md_q22	22. OBSERVE: Cleanliness of meat cutting board (enumerator: refer to photos)?	Clean/dirty	
md_q22a	22a. OBSERVE: How smooth is the meat cutting board? (enumerator: Refer to photos)	Smooth/rough	
md_q23	23. OBSERVE: How clean is the meat chopping block/log?	Clean/dirty	
md_q23a	23a. OBSERVE: How smooth is the meat chopping block/log?	Smooth/rough	
md_q27	27.OBSERVE: Cleanliness of stomach cutting board	Clean/dirty	
md_q28	28.OBSERVE: How smooth is the stomach cutting board?	Smooth/rough	
md_q29	OBSERVE: Cleanliness of butcher shop wall	Clean/dirty	
md_q30	OBSERVE: Cleanliness of butcher shop floor (enumerator: refer to photos)	Clean/dirty	

md_q51a	51a. Observe: Was the respondent able to quickly find a bottle with disinfectant in it?	Yes/No	
mb_q2	3. OBSERVE: How is money handled?	1. Same person who cuts meat handles money 2. Different persons handle meat and money 3. Did not observe transaction	Preventing cross-contamination
md_q19	Is shop wall in contact with meat	Yes/No	
md_q25b	25b. Separate: OBSERVE: If present, is stomach stored or kept separate from fresh meat? Observe if stomach is currently present, if not present, ask worker where stomach is stored.	Yes/No	
md_q26	26. OBSERVE: Is a different cutting board used for stomach?	Yes/No	
md_q31	31.OBSERVE: Butcher shop has sufficient lighting (to see well the colour of meat)?	Yes/No	Keeping environmental sanitation
md_q42	2. OBSERVE: Flies on meat (Select which apply)	1. None 2. Fewer than 5 3. Between 5 and 20 4. More than 20	
md_q43a_1	Ask/OBSERVE: are any fly control technologies present?	Fly trap	
md_q43a_2	Ask/OBSERVE: are any fly control technologies present?	Chira	
md_q43a_3	Ask/OBSERVE: are any fly control technologies present?	Nonelectric fly swatter	
md_q43a_4	Ask/OBSERVE: are any fly control technologies present?	Electric fly swatter	
md_q43a_5	Ask/OBSERVE: are any fly control technologies present?	Smoke repellent	
md_q43a_6	Ask/OBSERVE: are any fly control technologies present?	Electric repellent device	
md_q43a_7	Ask/OBSERVE: are any fly control technologies present?	Chemical repellent	
md_q43a_8	Ask/OBSERVE: are any fly control technologies present?	Fan	

md_q43a_9	Ask/OBSERVE: are any fly control technologies present?	wrap in plastic sheet	
md_q44	44.OBSERVE: Which is true about this butcher shop regarding solid waste management?	1. There is no container for solid waste 2. The same container is used for solid and liquid waste 3. It has a separate container for solid waste 4. Unable to observe	
md_q45a	45a.OBSERVE: Is there a cover on the container in which waste is kept?	Yes/No	
md_q45b	45b.OBSERVE: Is the lid is pedal-operated?	Yes/No	
md_q46	46.OBSERVE: Which is true about this meat shop regarding liquid waste management?	1. Liquide waste goes into the sewerage system 2. Liquide waste goes into a container with cracks or hole 3. Liquide waste goes into a container without cracks or hole 4. wastes are dump on the floor	
md_q47a	47a.OBSERVE: Is there a cover on the container in which liquid waste is kept?	Yes/No	
md_q47b	47b.OBSERVE: Is the lid is pedal-operated?	Yes/No	
mf_q24_1	40. OBSERVE: Which of the following tools are available at the handwashing station?	Water	
mf_q24_2	40. OBSERVE: Which of the following tools are available at the handwashing station (Select all that apply)?	Warm water	

mf_q24_3	40. OBSERVE: Which of the following tools are available at the handwashing station (Select all that apply)?	Soap	
mf_q24_4	40. OBSERVE: Which of the following tools are available at the handwashing station (Select all that apply)?	Clean towels or disposable paper towels	
mf_q24_5	40. OBSERVE: Which of the following tools are available at the handwashing station (Select all that apply)?	A mirror	
mf_q24_6	40. OBSERVE: Which of the following tools are available at the handwashing station (Select all that apply)?	Messages/instructions to motivate hand washing	
mf_q24_7	40. OBSERVE: Which of the following tools are available at the handwashing station (Select all that apply)?	Arrows leading to the hand washing station	
mf_q26	41. OBSERVE: Is the handwashing station placed where customers can see it?	Yes/No	
md_q32	32. Safe storage: OBSERVE/Ask: Is a functional refrigerator present?	Yes/No	Keeping meat safe
md_q36	36.OBSERVE: Use your thermometer to check: what is the fridge temperature? °C		
md_q37	37.OBSERVE: Is a freezer present (either as part of the fridge or separately)?	Yes/No	
md_q40	40.OBSERVE: What is the freezer temperature? °C		
md_q49a	49a. Observe: Was the respondent able to quickly find a bottle with sanitizer in it?	Yes/No	
md_q55	OBSERVE: Is a legal stamp from the abattoir present on the meat, or can the respondent show you a receipt from the abattoir for today's meat?	Yes/No	
md_q22a	22a. OBSERVE: How smooth is the meat cutting board? (enumerator: Refer to photos)	Smooth/rough	Using proper food contact surfaces

md_q23a	23a. OBSERVE: How smooth is the chopping block/log?	Smooth/rough	
md_q29	OBSERVE: Cleanliness of meat shop wall	Clean/dirty	
md_q28	How smooth is the stomach cutting board?	Smooth/rough	
Self-reported food safety practices			
md_q53	53.ASK, Do you use a chemical to combat contamination on your hands (sanitize)?	Yes/No	Keeping hand hygiene
md_q54_1	54. ASK What is used for sanitising hands?	Citric acid	
md_q54_2	54. ASK What is used for sanitising hands?	Acetic acid (vinegar)	
md_q54_3	54. ASK What is used for sanitising hands?	Chlorine solution	
md_q54_4	54. ASK What is used for sanitising hands?	Alcohol solution	
md_q54_5	54. ASK What is used for sanitising hands?	Gel sanitizer	
md_q54_6	54. ASK What is used for sanitising hands?	Zoe safe	
md_q59	59. ASK: How many times per day do you normally wash your hands during working hours (indicate frequency)??		Using proper and clean worksite clothing
md_q5	5. ASK Do you own your own work gown, or is it provided by your employer?	1. Provided by employer 2. I own it 3. Other specify 88. Refuse	
md_q7	For how many days do you normally wear a gown between washings?	1. Less than a day 2. One day 3. 2-3 days 4. 4-7 days 5. Other specify 88 Refuse	
md_q11	11. ASK: Is the water used in the butcher shop treated in any way?	Yes/No	Keeping water clean

md_q12_1	What is used for treating water?	Boiling	
md_q12_2	What is used for treating water?	Filtration	
md_q12_3	What is used for treating water?	Wuha agar	
md_q12_4	What is used for treating water?	Bishan gari	
md_q12_5	What is used for treating water?	Chlorine solution/tab	
md_q12a	ASK: Could you please show me the device or product you use to treat water?	Yes/No	
md_q9a	9. ASK: Is the worker able to show you towels of different colours for different purposes? (example, green for clean, red for dirt, etc.)?	Yes/No	Cleaning and disinfection of work surfaces
md_q23c_1	ASK: When do you normally wash the chopping block/log?	at the end of the day	
md_q23c_2	ASK: When do you normally wash the chopping block/log?	at the start of the day	
md_q23c_3	ASK: When do you normally wash the chopping block/log?	several times throughout the day	
md_q23c_4	ASK: When do you normally wash the chopping block/log?	at least once a week)	
md_q23c_5	ASK: When do you normally wash the chopping block/log?	less than once a week	
md_q28a_1	8a. ASK: At what point or points during your workday do you normally wash your cutting board or boards?	at the end of the day	
md_q28a_2	8a. ASK: At what point or points during your workday do you normally wash your cutting board or boards?	at the start of the day	
md_q28a_3	8a. ASK: At what point or points during your workday do you normally wash your cutting board or boards?	between uses for stomach and meat	
md_q28a_4	8a. ASK: At what point or points during your workday do you normally wash your cutting board or boards?	several times throughout the day	
md_q50	50. ASK: Are surfaces (meat cutting boards, meat hanging boards, chopping logs or knives) in the shop sprayed to combat contamination (disinfection)?	Yes/No	

md_q51_1	51. ASK/OBSERVE: What is used to disinfect surfaces? Could you show it to me, please?	Citric acid	
md_q51_2	51. ASK/OBSERVE: What is used to disinfect surfaces? Could you show it to me, please?	Acetic acid (vinegar)	
md_q51_3	51. ASK/OBSERVE: What is used to disinfect surfaces? Could you show it to me, please?	Chlorine solution/bleach such as Berekina	
md_q51_4	51. ASK/OBSERVE: What is used to disinfect surfaces? Could you show it to me, please?	Alcohol solution	
md_q51_5	51. ASK/OBSERVE: What is used to disinfect surfaces: Zoe safe? Could you show it to me, please?		
md_q56_1	56. ASK: What steps should meat sellers follow during cleaning work surfaces (Do not read responses, select all that respondent mentions)?	Scrape or remove food or debris from the surfaces	
md_q56_2	56. ASK What steps should meat sellers follow during cleaning work surfaces (Do not read responses, select all that respondent mentions):?	Wash the surfaces with hot water and detergents such as soap	
md_q56_3	56. ASK What steps should meat sellers follow during cleaning work surfaces (Do not read responses, select all that respondent mentions)?	Wash the surface with cold or warm water and detergent such as soap	
md_q56_4	56. ASK What steps should meat sellers follow during cleaning work surfaces (Do not read responses, select all that respondent mentions)?	Rinse the surfaces with water	
md_q56_5	56. ASK What steps should meat sellers follow during cleaning work surfaces (Do not read responses, select all that respondent mentions)?	Disinfect or sanitize the surfaces with appropriate chemicals such as chlorine solution (Berekina, etc.)	

md_q56_6	56. ASK What steps should meat sellers follow during cleaning work surfaces (Do not read responses, select all that respondent mentions)?	Allow the surface to air dry	
md_q57	57. ASK Deep cleaning: Is the butcher shop regularly deep cleaned? (that is cleaning involving all parts of the shop such as floors, walls, doors, windows, ceilings, tools and equipment [cutting board, hanging board, chopping blocks, hooks, knives, grinders, tables, etc] and even the environment surrounding the shop)?	Yes/No	
md_q58	58. ASK How often is deep cleaning done?	1. Daily 2. Twice weekly 3. Weekly 4. Once every 5. 2 weeks 6. Monthly 7. Less than monthly 88 Refuse	
md_q63_1	63. ASK: At what point or points during your workday do you normally wash your knife?	At the end of the day	
md_q63_2	63. ASK: At what point or points during your workday do you normally wash your knife?	At the start of the day	
md_q63_3	63. ASK: At what point or points during your workday do you normally wash your knife?	Between uses for stomach and meat	
md_q63_4	63. ASK: At what point or points during your workday do you normally wash your knife?	Several times throughout the day	

md_q63_5	63. ASK: At what point or points during your workday do you normally wash your knife?	Weekly	
md_q63_6	63. ASK: At what point or points during your workday do you normally wash your knife:?	Once every 2 weeks	
md_q64_1	63. ASK: At what point or points during your workday do you normally wash your knife sharpening?	At the end of the day	
md_q64_2	63. ASK: At what point or points during your workday do you normally wash your knife sharpening?	At the start of the day	
md_q64_3	63. ASK: At what point or points during your workday do you normally wash your knife sharpening?	Between uses for stomach and meat	
md_q64_4	63. ASK: At what point or points during your workday do you normally wash your knife sharpening?	Several times throughout the day	
md_q64_5	63. ASK: At what point or points during your workday do you normally wash your knife sharpening?	Weekly	
md_q64_6	63. ASK: At what point or points during your workday do you normally wash your knife sharpening?	Once every 2 weeks	
md_q67_1	63. ASK: At what point or points during your workday do you normally wash your grinder?	At the end of the day	
md_q67_2	63. ASK: At what point or points during your workday do you normally wash your grinder?	At the start of the day	
md_q67_3	63. ASK: At what point or points during your workday do you normally wash your grinder?	Between uses for stomach and meat	
md_q67_4	63. ASK: At what point or points during your workday do you normally wash your grinder?	Several times throughout the day	
md_q67_5	63. ASK: At what point or points during your workday do you normally wash your grinder?	Weekly	

md_q67_6	63. ASK: At what point or points during your workday do you normally wash your grinder?	Once every 2 weeks	
md_q62	62. ASK/OBSERVE: Do you have separate knives for cutting meat and stomach?	Yes/No	Preventing cross-contamination
md_q66	66. ASK: Do you use the same grinder for stomach and meat?		
md_q48a	48a. Sanitise ASK: Is the meat at this shop sprayed to combat contamination (sanitization)?	Yes/No	Keeping meat safe
md_q49_1	9. ASK/Observe: what is used for sanitizing meat? Could you show it to me, please?	Citric acid	
md_q49_2	9. ASK/Observe: what is used for sanitizing meat? Could you show it to me, please?	Acetic acid (vinegar)	
md_q49_3	9. ASK/Observe: what is used for sanitizing meat? Could you show it to me, please?	Chlorine solution/bleach such as Berekina	
md_q49_4	9. ASK/Observe: what is used for sanitizing meat? Could you show it to me, please?	Alcohol solution	
md_q49_5	9. ASK/Observe: what is used for sanitizing meat? Could you show it to me, please?	Zoe safe (commercial name of locally produced electrolysed water)	
md_q61	61. ASK: Do you normally stay home from work when you have symptoms of diarrhoea and/or vomiting?	Yes/No	Worker health
md_q61a	61a. ASK: Are you paid for days when you stay home from work because of you are ill?	Yes/No	
me_q1	Have you ever received training in food safety?	Yes/No	Food safety training
me_q2	When was the last time you received food safety training (indicate in months/years)?		
me_q2a	Can you please show me the certificate of the most recent training you attained?	Yes/No	

me_q4_1	What are some rules or recommended practices you learned in the training?	Clean water	
me_q4_2	What are some rules or recommended practices you learned in the training?	Clean food contact surfaces	
me_q4_3	What are some rules or recommended practices you learned in the training?	Clean hands	
me_q4_4	What are some rules or recommended practices you learned in the training?	Clean cloths/clothes	
me_q4_5	What are some rules or recommended practices you learned in the training?	Clean tools	
me_q4_6	What are some rules or recommended practices you learned in the training?	Separate	
me_q4_7	What are some rules or recommended practices you learned in the training?	Sequence (first in first out)	
me_q4_8	What are some rules or recommended practices you learned in the training?	Safe storage	
me_q4_9	What are some rules or recommended practices you learned in the training?	Sanitise	
me_q4_99	What are some rules or recommended practices you learned in the training?	Don't know	

Supplementary material 8. Filled-in CONSORT 2025 checklist for randomised control trial food safety intervention in butcher shops

Section / Topic	No	CONSORT 2025 checklist item description	Reported on page no.
Title and abstract			
Title and structured abstract	1a	Identification as a randomised trial	1
	1b	Structured summary of the trial design, methods, results, and conclusions	1
Open science			
Trial registration	2	Name of trial registry, identifying number (with URL) and date of registration	15
Protocol and statistical analysis plan	3	Where the trial protocol and statistical analysis plan can be accessed	15
Data sharing	4	Where and how the individual de-identified participant data (including data dictionary), statistical code and any other materials can be accessed	32
Funding and conflicts of interest	5a	Sources of funding and other support (e.g., supply of drugs), and role of funders in the design, conduct, analysis and reporting of the trial	32
	5b	Financial and other conflicts of interest of the manuscript authors	32
Introduction			
Background and rationale	6	Scientific background and rationale	2-4
Objectives	7	Specific objectives related to benefits and harms	4
Methods			
Patient and public involvement	8	Details of patient or public involvement in the design, conduct and reporting of the trial	10
Trial design	9	Description of trial design including type of trial (e.g., parallel group, crossover), allocation ratio, and framework (e.g., superiority, equivalence, non-inferiority, exploratory)	5-7
Changes to trial protocol	10	Important changes to the trial after it commenced including any outcomes or analyses that were not prespecified, with reason	N/A
Trial setting	11	Settings (e.g., community, hospital) and locations (e.g., countries, sites) where the trial was conducted	4
Eligibility criteria	12a	Eligibility criteria for participants	4
	12b	If applicable, eligibility criteria for sites and for individuals delivering the interventions (e.g., surgeons, physiotherapists)	5
Intervention and comparator	13	Intervention and comparator with sufficient details to allow replication. If relevant, where additional materials describing the intervention and comparator (e.g., intervention manual) can be accessed	6, also see: https://doi.org/

			10.21203/rs.3.rs-8934544/v1
Outcomes	14	Pre-specified primary and secondary outcomes, including the specific measurement variable (e.g., systolic blood pressure), analysis metric (e.g., change from baseline, final value, time to event), method of aggregation (e.g., median, proportion), and time point for each outcome	10
Harms	15	How harms were defined and assessed (e.g., systematically, non-systematically)	5
Sample size	16a	How sample size was determined, including all assumptions supporting the sample size calculation	5
	16b	Explanation of any interim analyses and stopping guidelines	N/A
Randomisation:			
Sequence generation	17a	Who generated the random allocation sequence and the method used	6
	17b	Type of randomisation and details of any restriction (e.g., stratification, blocking and block size)	6
Allocation concealment mechanism	18	Mechanism used to implement the random allocation sequence (e.g., central computer/telephone; sequentially numbered, opaque, sealed containers), describing any steps to conceal the sequence until interventions were assigned	6
Implementation	19	Whether the personnel who enrolled and those who assigned participants to the interventions had access to the random allocation sequence	6
Blinding	20a	Who was blinded after assignment to interventions (e.g., participants, care providers, outcome assessors, data analysts)	6
	20b	If blinded, how blinding was achieved and description of the similarity of interventions	6
Statistical methods	21a	Statistical methods used to compare groups for primary and secondary outcomes, including harms	12-15
	21b	Definition of who is included in each analysis (e.g., all randomised participants), and in which group	12
	21c	How missing data were handled in the analysis	12
	21d	Methods for any additional analyses (e.g., subgroup and sensitivity analyses), distinguishing prespecified from post-hoc	14
Results			
Participant flow, including flow diagram	22a	For each group, the numbers of participants who were randomly assigned, received intended intervention, and were analysed for the primary outcome	8
	22b	For each group, losses and exclusions after randomisation, together with reasons	8
Recruitment	23a	Dates defining the periods of recruitment and follow-up for outcomes of benefits and harms	4
	23b	If relevant, why the trial ended or was stopped	N/A
Intervention and comparator delivery	24a	Intervention and comparator as they were actually administered (e.g., where appropriate, who delivered the intervention/comparator, how participants adhered, whether they were delivered as intended [fidelity])	8-10, also see: https://doi.org/

			10.21203/rs.3.rs-8934544/v1 (pages: 20-26)
	24b	Concomitant care received during the trial for each group	N/A
Baseline data	25	A table showing baseline demographic and clinical characteristics for each group	15-21
Numbers analysed, outcomes and estimation	26	For each primary and secondary outcome, by group: - the number of participants included in the analysis - the number of participants with available data at the outcome time point - result for each group, and the estimated effect size and its precision (such as 95% confidence interval) - for binary outcomes, presentation of both absolute and relative effect size	8 (see Fig 2), 22-25
Harms	27	All harms or unintended events in each group	N/A
Ancillary analyses	28	Any other analyses performed, including subgroup and sensitivity analyses, distinguishing pre-specified from post-hoc	N/A
Discussion			
Interpretation	29	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	26-29
Limitations	30	Trial limitations, addressing sources of potential bias, imprecision, generalisability, and, if relevant, multiplicity of analyses	30

Note: N/A refers to Not Applicable