

Exploring Behavioural Economics: Using ‘Nudge Theory’ to improve the effectiveness of SafePORK interventions in Vietnam

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Abbreviations

DARD	Department of Agriculture and Rural Development
FBDs	Food-borne diseases
ILRI	International Livestock Research Institute
PCV	Pork value chain
PigRISK	Reducing disease risks and improving food safety in smallholder pig value chains in Vietnam project
RVC	Royal Veterinary College
SafePORK	Market-based approaches to improving the safety of pork in Vietnam project

Executive summary

Pork is the most popular meat consumed in Vietnam and studies have shown high (28.6-44%) *Salmonella* contamination rates at the point of purchase, resulting in a high incidence rate of *Salmonella* related food borne disease (Toan *et al.* 2013, Unger 2018). The high microbial contamination rate is attributed to poor hygiene practice in the pork value chain (PCV) and the market-based approaches to improving the safety of pork in Vietnam, or SafePORK project has designed a set of interventions to improve the standard of practice (Unger *et al.* 2018) which are due to be trialed in 2019.

Behavioral economics and 'nudges' are defined as interventions with a low level of intrusiveness on personal choice which can be used to alter behavior (Thaler and Sunstein 2008). While they have not yet been used for food safety in the pork value chain, some of the proposed interventions aim to alter actor's behavior and thus could be amenable to 'nudging'. A previous research project to assess the potential of nudges to improve pork safety in Vietnam (Sunghwan 2018) highlighted three main themes which could be used to influence actors within the value chain; 1) actors were most influenced by people they respected, which within the study groups were found to be veterinarians and actor's peers, 2) actor's reputation was regarded as an important incentive, and 3) salient visual methods of displaying information were found to be a commonly used method of delivering information in existing food safety interventions.

A stakeholder workshop, supported by the SafePORK project, International Livestock Research Institute (ILRI), and the Royal Veterinary College (RVC), was held in Hanoi to gain a better understanding of the slaughterhouse and retail processes to ascertain which nudges could be used to support the proposed interventions, and to discuss the practical aspects of implementing nudges. Participants included actors (n=32) from various parts of the pork value chain, including slaughterhouse workers, retailers, veterinarians, government officials, and researchers. During the workshop participants were separated into small groups and took part in group discussions to explore the slaughterhouse and retail processes and discuss the feasibility of using nudges to change actor's behaviors. Participants were shown several potential nudges (posters, arrows, and footprints) and asked to evaluate these through discussion and a scoring exercise. After each activity a plenary session took place to allow dissemination of feedback to the entire group.

The workshop found that the slaughterhouse workers and retailers appeared to be aware of the major issues surrounding foodborne disease in their industry, highlighting, during the discussions, many of the key points in the pork production chain where meat contamination with microorganisms can occur. The concept of using posters to display information was well received by the workshop participants. Both positive and negative framing of information were thought to be effective, the choice of which dependent on the target audience. However, when scored by participants, the negatively framed posters scored significantly higher than the positively framed posters, indicating a greater anticipated impact on actor's behavior. All participants discussed the need to have site specific photos to reflect the real context of the setting to increase engagement with the media. When considering the effect of color on salience; red was considered dirtiest, yellow, orange, and purple considered neutral colors, and green and blue considered the cleanest colors.

The participants thought that the prospect of upscaling nudges to a broader audience of retailers and consumers could be implemented but would need to be supported by competent food safety authorities.

Recommended next steps

Using the findings from this workshop, site specific nudges should be created to support specific SafePORK interventions, which at this stage are likely to be in the form of informational posters. Ideally, in addition to testing the interventions in a randomly controlled trial, the nudges would be similarly tested to allow assessment of their effectiveness.

Further investigation, such as trialing the use of footprints and arrows in slaughterhouse environments, is needed to ascertain the practicality of using these nudge concepts to designate clean and dirty zones.

Introduction

Pork is the most popular meat consumed in Vietnam and consumption per capita (30kg/year) is one of the highest in the world (OECD 2016). Studies have shown a high prevalence of *Salmonella* contamination rate of pork purchased at market (28.6-44%), resulting in a high incidence rate (17%) of *Salmonella* related food borne disease (FBD) within the Vietnamese population, with an estimated annual cost to the country of 170-340 million USD (Toan *et al.* 2013, Unger 2018). The high *Salmonella* contamination rate is attributed to a variety of factors which occur along the pork value chain (PVC), including (but not limited to); 1) contaminated water sources on farms and in slaughterhouses, 2) slaughterhouse practices such as slaughtering pigs on the floor, 3) retail practices including the wiping of produce with dirty cloths, and 4) unhygienic processing and cooking practices by the consumer. Consequently, the issue of FBDs within the pork industry are of major concern to both the Vietnamese government and public (Nga *et al.* 2014) and dealing with the topic is considered a national priority (Dang-Xuan *et al.* 2017).

In 2010 the Vietnamese government implemented a new food-safety law which explained the rights and obligations of companies and individuals regarding food safety (Russin and Vecchi 2016). Official campaigns have been communicated in the mass media with the aim of providing information to the public about food safety (Nguyen-Viet *et al.* 2017). Despite these efforts food safety has yet to improve with distrust in government regulatory systems and a lack of motivation amongst PVC actors to improve the safety of pork cited as reasons for the policy failure (Nguyen-Viet *et al.* 2017).

Behavioral economics and 'nudge theories' exist within the philosophy of libertarian paternalism and explain how individuals can be encouraged to change their behavior in a way that produces a net societal benefit (Thaler and Sunstein 2008). Nudges have not yet been used for food safety in the PVC, but research has suggested interventions to promote better hygiene practices which include altering actor's behavior and thus could be amenable to 'nudging' (Unger *et al.* 2018). Nudges are defined as interventions with a low level of intrusiveness on personal choice and several theoretical frameworks exist, such as the Nuffield intervention ladder, MINDSPACE, and EAST frameworks, which are used to define and categorize the interventions. The Nuffield intervention ladder describes the level of intrusiveness in interventions on an eight-grade scale, ranging from, at the lowest level of intervention; doing nothing, to the highest level of intervention; eliminating choice. Within this framework nudges are defined as interventions with less intrusiveness than incentives (Table 1) (Nuffield Council on Bioethics 2007). The MINDSPACE anagram is an analytical framework which uses nine elements repeatedly found in human behaviors to define nudges (Table 2) (Dolan *et al.* 2012). The EAST framework has four psychological elements related to increasing the uptake of interventions, which are; easy, attractive, social, and timely (Service *et al.* 2014).

Table 1. The Nuffield intervention ladder (Nuffield Council on Bioethics 2007)

Interventions (from highest to lowest level of intrusiveness)
Eliminate choice e.g. banning the use of something or making an activity illegal
Restricting choice; limiting the options available to people
Guiding choice through disincentives; using fiscal or non-fiscal disincentives to persuade people not to make a choice, e.g. taxes, premiums
Guiding choice through incentives; using fiscal or non-fiscal incentives to persuade people to make a choice

Guiding choice through changing the default

Enabling choice

Providing information

Do nothing, simply monitor the situation

Nudges highlighted in blue

Table 2. The MINDSAPCE framework taken from Dolan et al. 2012

Messenger	We are heavily influenced by who communicates information
Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses
Norms	We are strongly influenced by what others do
Defaults	We 'go with the flow' of pre-set options
Salience	Our attention is drawn to what is novel and seems relevant to us
Priming	Our acts are often influenced by sub-conscious cues
Affect	Our emotional associations can powerfully shape our actions
Commitments	We seek to be consistent with our public promises
Ego	We act in ways that make us feel better about ourselves

A previous research project to assess the potential of nudges to improve pork safety in Vietnam (Sunghwan 2018) used these frameworks to identify themes that could be used to influence actors within the value chain. Results highlighted three main themes with potential for application in nudging; 1) actors were most influenced by people they respected, which within the study group were found to be veterinarians and actor's peers, 2) actor's reputation was regarded as an important incentive, and 3) salient visual methods of displaying information were found to be a commonly used method of delivering information in existing food safety interventions.

SafePORK interventions

The proposed SafePORK interventions are based on the findings of the reducing disease risks and improving food safety in smallholder pig value chains in Vietnam, or PigRISK project (Nguyen-Viet 2014) and have highlighted areas across the PVC where improvements in hygiene could be made. The workshop focused on the interventions at the level of the slaughterhouse and retailer.

Summary of proposed interventions:

Slaughterhouse interventions:

1. Introduction of portable 'ozone' machines to plug into water supplies to improve hygiene of water for cleaning
2. Separation of clean and dirty zones to reduce the incidence of bacterial cross contamination
3. Reducing the occurrence of on-floor slaughter to reduce the incidence of bacterial cross contamination
4. Reducing the use of dirty cloths to wipe carcasses and meat

Retailer interventions

1. Introduction of hygiene measures to reduce bacterial contamination
 - a. Use of antimicrobial cutting boards
 - b. Reducing the use of dirty cloths to wipe carcasses and meat
 - c. Introducing the use of aprons to improve hygiene
 - d. Increasing the frequency of hand washing and the use of disinfectants and hand sanitizers

Workshop aim and objectives

The aim of the workshop was to explore how nudges could be used to increase uptake of interventions proposed by the SafePORK group. Actors from various stakeholders in the pork value chain (slaughterhouse workers and pork retailers) as well as researchers from the SafePORK team were invited to take part in a one-day workshop, which took place in Hanoi on 27 November 2018.

Workshop objectives:

1. To explore the slaughterhouse processes which increase the risk of microbial contamination of meat and establish the desired behavioral changes needed in the slaughterhouse actors.
2. To investigate which variables affect the salience of visual methods of communicating information about foodborne diseases.
3. To discuss the practicalities of implementing nudges into the slaughterhouse and retail environment.
4. To explore how nudges could be scaled up to influence a broader audience of retailers and consumers.

Participants in the morning of the workshop consisted of ILRI and RVC researchers, national and local food safety authorities from Hanoi and provinces where the SafePORK project is implemented, and actors from various aspects of the PVC.

Workshop structure – methods and materials

The day began with an opening address from the assistant director general of ILRI, Shirley Tarawali. Barbara Häsler (RVC) gave an introduction on behavioral economics and nudge theory and discussed the objectives of the workshop. Mathew Hennessey (RVC) gave examples of previous successful nudge projects in south-east Asia and a short summary

of Sunghwan Kim’s research project findings, i.e. the survey work conducted previously to identify potential nudges. Fred Unger (ILRI and SafePORK principle investigator) gave an overview of the SafePORK project, highlighting why the research is necessary with respect to tackling food-borne diseases (FBDs) in Vietnam, and described the interventions on which the nudges would be used.

Following the introductions, the workshop participants took part in group discussions to ascertain which of the slaughterhouse processes could be responsible for microbial contamination of pork and also be targeted for ‘nudging’. Participants were separated into four groups to discuss; (1) the location of slaughter, (2) separation of clean and dirty zones, (3) wiping of carcasses with cloths, (4) cleaning and disinfection practices during slaughter. Each group contained five to seven participants plus an ILRI member of staff who acted as facilitator and note taker. During the discussions the facilitators encouraged all participants to contribute to discussions and guided the participants through a series of prompt questions (to understand the underlying process, how the process could be altered, and what behavioral change would be needed to support this). The results of the group discussions were shared with the other groups during a plenary session to stimulate additional discussion.

Afterwards, practical exercises were utilized to explore the effect of different variables (language, images, color) on the ability to communicate information about food safety and instigate a change in user behavior. Within language the concept of positive and negative framing was investigated on the ability to deliver of food safety information. Positive framing, such as “*Not slaughtering pigs on the floor can produce safer pork*” aims to highlight the gains to be made through compliance, while negative framing, such as “*Slaughtering on the floor leads to an increased risk of contaminated pork*” aims to highlight the risks of non-compliance. A meta-analysis of human disease prevention messages found that positively-framed appeals were statistically more persuasive than negatively-framed appeals (O’Keefe and Jensen 2007). However, (Rothman *et al.* 1999) found that the relative influence of positive and negative-framing was dependent on actors perception of the risk, and so may be user dependent. Similarly, images can be positively and negatively framed depending on their content, and may also be able to induce an emotional response in the viewer, which can either increase or decrease the likelihood of behavioral change (Houts *et al.* 2006). We investigated whether using photos of real-life situations or cartoons would impact observer response.

Using iterations of these variables (Table 3), posters were designed which contained information relating to the concepts which underlined some of the proposed food safety interventions designed by SafePORK. These concepts were (1) not slaughtering pigs on the floor, (2) hand and equipment hygiene, (3) the wiping of meat with cloths.

Table 3. Iterations of variables used to create visual media

Language	Image	Colour
Positively framed	Photo	Red, Yellow, Blue, Green
	Cartoon	Red, Yellow, Blue, Green
Negatively framed	Photo	Red, Yellow, Blue, Green
	Cartoon	Red, Yellow, Blue, Green

Participants remained in the same groups as for the group discussions and were given 15 minutes to complete each station. For the first two poster stations, participants were given a scoring sheet (Appendix 5) and asked to score each poster on its ability to impact food safety behaviors. The first behavior was whether a slaughterhouse worker would be more or less likely to slaughter pigs on the floor after seeing a poster showing various slaughter images (Appendix 4,

A1-A9); the second behavior was whether a pork retailer would be more or less likely to clean their hands and equipment after viewing a corresponding poster (Appendix 4, B1-B8). Likert questions were used which were assigned a score of 1 for least likely to perform a behavior through to 7 for most likely to perform a behavior, with a score of 4 for no change in behavior.

Additional visual material was created to explore the relationship between color and food safety and the use of symbols (arrows and footprints) in their ability to direct people within a workplace. Participants were given a scoring sheet and asked to rank seven colors, from the dirtiest to the cleanest (1 being the dirtiest, to 7 being the cleanest). Additionally, participants were asked to choose the arrow or footprint which they thought would be most effective at directing people in the workplace. A score of one point was allocated to the participants preferred symbol, and then the scores summed. Where participants chose more than one option but did not state a preference the one point was divided equally between the chosen options.

In the afternoon, some of the SafePORK participants left the workshop (including representatives from national and local animal health and food safety authorities) and were replaced by actors from local slaughterhouses and retailers. Additional group discussions took place to gather feedback about the feasibility of using the proposed nudges in the pork value chain, and the possibility of upscaling the nudges to a wider audience. Groups consisted of six to nine participants per group. Participants were also shown the nudge posters from the morning session and encouraged to give feedback during the group discussion. It was expected that the local PVC actors would respond in a more open manner in the absence of figures of authority. Again, an ILRI member of staff acted as facilitator and notetaker, and findings were shared in a group plenary session.

Finally, Fred Unger and Barbara Häsler provided a summary of the overall findings from the day.

R studio (1.1.456) was utilized to examine difference in the outcomes of scored exercises using a paired student T test or one-way ANOVA (with Tukey’s post hoc analysis where necessary) with $p < 0.05$ taken as the level of significance.

Outcomes of activities

Activity I–Morning – Discussion of slaughterhouse processes

Each group of participants was guided through a series of prompt questions (to understand the underlying process, how the process could be altered, and what behavioral change would be needed to support this) relating to aspects of the slaughterhouse process.

Figure 1. Questions asked for morning activity I

	Group 1: Avoidance of floor slaughter	Group 2: Separation of clean and dirty zones	Group 3: Not wiping carcass with dirty cloth	Group 4: Cleaning and/or disinfection during slaughter
Investment / infrastructure to be provided	Provision of: 1) Grids 2) Tables	Establishment of new processes Demarcation	Provision of relevant materials Training	Provision of relevant materials Training

	3) Hanging system	Training		
Question 1	What is the current slaughter process?	What are the current processes and flows and is there a separation?	What is currently done and how (i.e. carcass wiping with cloth)?	What cleaning and disinfection is currently done?
Question 2	How could the current slaughter process be improved?	What (further) separation should there be/what would a separation look like?	What other practice could be used instead?	How could cleaning and disinfection during slaughter be improved?
Question 3	To move to another system (e.g. to change from floor to table) what steps would need to change and how?	What would need to change in the slaughterhouse for the separation to be possible?	What would need to change in the slaughterhouse for this other practice to be possible?	What changes would need to be introduced to make this happen?
Question 4	What would workers need to do differently?	What would workers need to do differently?	What would workers need to do differently?	What would workers need to do differently?
Summary	What is the desired behavioral change of slaughterhouse workers?			

Group 1: Avoidance of floor slaughter

Table 4. Morning, group 1, participants

Name	Gender	Place of work
Participant 1	F	Hung Yen - Livestock Dept, Department of Agriculture and Rural Development (DARD)
Participant 2	F	Vietnam National University of Agriculture
Participant 3	M	Vietnam National University of Agriculture
Participant 4	F	ILRI

Current practice

The most common practices experienced by the participants of the group consisted of; 1) washing pigs in the pig holding areas, 2) stunning pigs with electricity or a blunt instrument (though it was noted that not all pigs were stunned before slaughter), 3) moving pigs to the slaughter area, 4) bleeding the pigs, 5) pouring boiled water over the pigs, 6) shaving hair from the carcass, 7) evisceration and deboning of the carcass.

Participants highlighted three commonly used areas for slaughter; 1) on the floor, 2) cement platforms, and 3) inox/stainless steel platform. Hanging slaughter systems were not used by any of the participants. It was discussed that

some slaughterhouses used a large inox/stainless steel platform to cover the entire floor so that all activities take place on the platform and workers have to walk on the platform.

Proposed improvement

The participants agreed that efforts were needed to avoid contamination of pork by avoiding slaughtering pigs on the floor and by disposing of waste material efficiently. The group thought that the ideal solution would be to use a hanging slaughter system, though it was acknowledged that this change may be not feasible due to; 1) the cost of the infrastructure needed, 2) availability of space, and 3) worker unfamiliarity with hanging systems.

Group 2: Separation of clean and dirty zones

Table 5. Morning, group 2, participants

Name	Gender	Place of Work
Participant 5	F	Bac Tom
Participant 6	M	Vietnam National University of Agriculture
Participant 7	F	Wageningen University
Participant 8	M	ILRI
Participant 9	F	National Institute of Animal Sciences
Participant 10	M	Vietnam National University of Agriculture

Current practice

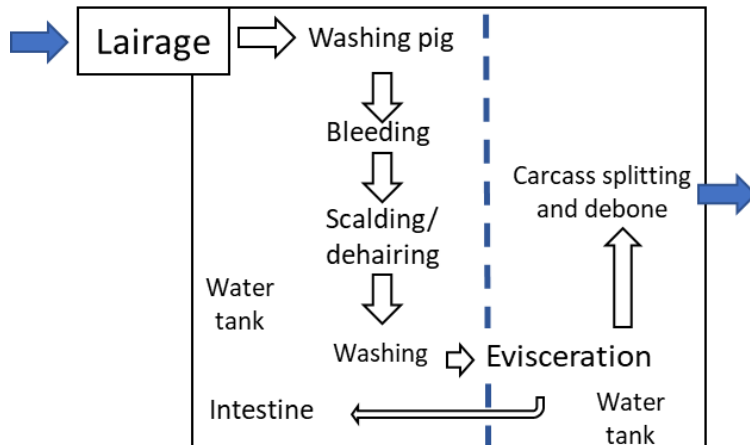
While some separation of clean and dirty activities exists within the slaughterhouses (separate areas for stunning, bleeding, scalding, evisceration, deboning), the major problem highlighted by the group was that workers move freely between areas without considering the risks of cross-contamination. It was thought that most slaughterhouse owners and workers were unaware of the need to separate processes during slaughter and workers' decisions are based on the need to work quickly (rather than hygienically) as slaughtering takes place early in the morning (from 2.30-5.30am) to allow delivery of fresh pork to markets later that day.

Proposed improvement

A separation of slaughterhouse processes should take place using separation lines or virtual barriers (e.g. lines or walls) which indicate dirty and clean areas. Workers should be assigned to work in a clean or dirty zone and should not move between zones during the slaughter process.

Suggestions for clean activities were evisceration and slitting or deboning. Dirty activities were considered to be restraining pigs, bleeding, and dehairing.

Figure 2. Designation of dirty and clean zones in the slaughterhouse as proposed by the group



It was noted that increased access to water would be needed to allow easy and convenient washing of hands, equipment, and carcasses. Hygiene protocols and ideal slaughter practice guides should be provided to the workers and slaughterhouse owners to highlight the importance of the separation of activities.

Group 3: Not wiping carcass with dirty cloth

Table 6. Morning, group 3, participants

Name	Gender	Place of Work
Participant 11	F	National Institute of Animal Sciences
Participant 12	F	Australian Centre for International Agricultural Research
Participant 13	M	Hanoi - Retailers Bac Tom
Participant 14	M	Hoa Binh - Livestock Production & Animal Health Dept.
Participant 15	F	ILRI
Participant 16	M	Department of Agriculture, Hoa Binh province

Current practice

The group discussed that during the slaughter process carcasses and meat were commonly wiped with a cloth to remove dirt and fluid. It was ascertained that a common conception of the participants was that wet meat becomes spoiled and discolored (especially in summer season when the outside temperature is high) and wiping the meat is necessary to preserve its red color which is perceived as sign of freshness by consumers.

The cloths used for wiping meat are usually from old, discarded cotton clothes or mosquito nets. Usually pieces of cloth are used for the whole working day. At the end of a day, the dirty cloths are washed with hot water and/or detergents for use the following day. It was acknowledged by the group that this kind of practice poses a high risk for pork safety due to the risk of cross-contamination.

Proposed improvements

The group said that ideally, slaughterhouses should invest in new cloths and use just one piece of cloth to wipe one pig only, but said that the cloths could be reused the next day after washing with clean hot water (it was thought that hot water can kill 99% of bacteria, though the group did not specify how hot the water needed to be).

The group suggested that at a minimum those slaughterhouse owners who did not want to spend money on new cloths, could wash the cloths with hot water between each pig, though it was recognized that this practice would probably not improve pork safety significantly because the hot water used inside the slaughterhouses is not clean (and often not hot enough to kill bacteria) and this process is time consuming.

It was suggested that each slaughterhouse should have two plastic baskets placed at the carcass cutting section, of which one basket could be used to store clean cloths and one to store dirty cloths. All dirty cloths would be collected for washing at the end of a working day.

Group 4: Cleaning and/or disinfection during slaughter

Table 7. Morning, group 4, participants

Name	Gender	Place of Work
Participant 17	M	National Institute of Animal Sciences
Participant 18	M	Vietnam National University of Agriculture
Participant 19	F	Department of Animal Health
Participant 20	M	Hoa Binh - Livestock Production & Animal Health Department
Participant 21	F	Vietnam National University of Agriculture
Participant 22	M	Hanoi University of Public Health
Participant 23	M	Hanoi University of Public Health

Current practice

Before slaughter most pigs are washed (with underground water from a pump), which occurs early in the morning (2-3am). During slaughter, water is used to wash the carcass and floor to remove blood and faecal matter. At the end of the slaughter process (around 5am) workers wash the slaughterhouse area with water. Disinfectant is used, on average, around once a week to clean the slaughterhouse. For some small slaughterhouses there is no system to treat solid and liquid waste and effluent may be discharged directly to the public drainage.

Proposed improvements

The group discussed that there was a need to check current water sources to ensure they are hygienic. It was recognized that many slaughterhouses needed to upgrade their equipment (e.g. knives, hooks, sharpeners, knife holding racks, boots) and have facilities for workers to be able to clean and disinfect this equipment. Separating the lairage area from the slaughter areas, and having separate areas for splitting, deboning, and evisceration was thought to be the best way to improve the hygiene of the process.

The group discussed that the slaughterhouse workers should have frequent health checks (e.g. twice a year).

The group discussed that veterinary authorities (Sub-Department of Animal Health) should inspect the conditions of the slaughterhouse and provide certification of those premises with adequate levels of hygiene and slaughter practice. Slaughter workers should have to follow the slaughtering procedure and requirements for personal and professional hygiene.

Activity 2–Morning – Four stations

Station 1: Slaughterhouse posters for off-floor slaughtering (Appendix 4, posters A1-A9)

Across all groups, the preferred wording on the posters was the positive framing, i.e. '*Slaughtering on the table will improve cleanliness of pork/food safety*' rather than the negatively framed '*Slaughtering on the floor will decrease the cleanliness of pork/food safety*'. However, it was discussed that for workers with low level of education, posters with negatively frames messages (for example a warning or an order) may have a stronger effect, and for workers with medium or higher level of education, posters with positive, emotional messages would work better.

People commented that the images used should be photos of real situations (participants responded negatively to the use of cartoon images) and contain images of people, showing clean steel tables, clean floors and equipment, have workers wearing uniforms, and include pictures of pigs.

The participants thought that a large (e.g. A1 size) yellow poster would be preferable as it would be bright and therefore noticeable (in what is often a dark working environment). It was suggested that the posters could be placed at the entrance, middle, and the end of the slaughtering process.

Only seven participants filled in the scoring sheets for the posters. Consequently, it was not possible to perform statistical analysis on this data.

Station 2: Retailer posters for cleaning (Appendix 4, posters B1-B8)

During the discussions, participants selected two posters from this group (B-4 and B-7), with contrasting images and language framing, as being the most effective in their method of communication. Some participants liked how the message in B-4, a positively framed poster with the information; '*Properly cleaning your hands and equipment...promotes safer pork*', was clear and to the point. It was thought that this poster would work best in green or blue as these colors would encourage, and not enforce, people to change their behavior. Some participants said that poster B-7, a negatively framed poster with the information; '*Dirty hands and equipment...leads to contaminated meat*', conveyed a strong message to the observed and had greater impact than the other posters. It was thought that this poster should be in either red or yellow to be more noticeable and these colors were thought to be linked to warnings.

Poster scoring was completed by 17 participants. All the posters received a mean behavioral change score over 4, which equated to actors being more likely to wash their hands and equipment. Poster B-7 had the highest mean score (mean=5.65), though this was not significantly higher than the other posters. When the posters were grouped by framing of language, posters which utilized negative framing had a statistically higher mean score (mean=5.32, n=34) than the positively framed posters (mean=4.73, n=108) $p=0.02$.

The need to use real photos/images which are appropriate for the local context (e.g. correct knives, chopping boards, retailers) was discussed by all of the groups at this station. This was supported by the fact that the participants said that the posters which utilized cartoon images had no impact.

Participants thought that the posters should be as large as appropriately possible (with several people mentioning A-1 as the best size) for the market and either be placed in a single position where the retailers and consumers could both see, or placed at the start, middle, and the end of the market area, and possibly being printed on both sides so that the poster could be hung from the ceiling.

Some participants thought that the posters could be made more effective with the addition of an image which to imply the consequences of FBDs (such as an ambulance or a hospital), though several people raised concerns about the use of negative images and messages putting off customers and favored B4.

B-4

**Properly cleaning your hands
and equipment**



promotes safer pork'

B-7

**Dirty hands and
equipment**



leads to contaminated meat

Station 3: Retailer – combination of information (Appendix 4, posters C1-C4)

Participants thought that the poster C-1 showed clear guidance for each action and thought the tick box conveyed a strong notion of commitment, though it was noted that each message should not be written in the first person, such as 'I use hygienic cutting boards', but be a command, such as 'Use hygienic cutting boards'. The checklist was found to be more effective with real life pictures. Again, the location of the poster was discussed, and it was agreed that a place should be chosen that is obvious to both the retailer and the consumer.

Figure 3. Poster C-1

C-1

We promote safer pork

- ✓ I use hygienic cutting boards



- ✓ I do not wipe meat with dirty cloths



- ✓ I regularly clean my equipment with hot water and disinfectant



Station 4: Slaughterhouse – use of colours and arrows for demarcation of clean and dirty zones (Appendix 6)

Colour scoring exercise

Twenty participants took part in this exercise. Analysis of mean rank scores for each color using a one-way ANOVA demonstrated a significant difference between groups ($p < 0.001$). Post-hoc analysis with Tukey's Honest Significant Difference test revealed three distinct groups within the colors, red was significantly 'dirtier' than the other colors, yellow, orange and purple formed a second group in the middle of the ranking, and dark blue, light blue, and green formed a third group of colors which ranked significantly 'cleaner' than the other colors.

Table 8. Selection of colors to represent from dirty (1) to clean (7)

Ranking	Colour (mean ranking)
Dirty	Red (1.3)
Neutral	Orange (2.8)
Neutral	Purple (3.25)
Neutral	Yellow (3.4)
Clean	Dark blue (4.95)
Clean	Light blue (5.9)
Clean	Green (6.4)










Arrow/footprint exercise

Twenty participants took part in this exercise.

Symbols 7 and 8 had the highest overall preference score and discussion with participants at the station highlighted that participants thought them to be easy to understand.

It was discussed that directional symbols should be placed on the floor or wall/column within the slaughterhouse, be large enough for people to see easily, and would not need to be supported by text. No discussion took place as to the practicality of how these symbols could be put into place in slaughterhouses (e.g. painting directly onto walls or floors).

Table 9. Selection of the logos to direct people

Symbol	Score		Score
	7.5		0.66
	7		0.5
	2.66		0
	1		0
	0.66		

Activity 3–Afternoon – Further discussion of proposals from morning activities

Group 1. Social norms (slaughterhouse group)

Table 10. Afternoon, group 1, participants

Name	Gender	Place of Work
Participant 24	M	Hanoi - Retailers Bac Tom
Participant 25	M	Hung Yen - Tien Lu, Slaughterhouse
Participant 26	M	Soc Son - Slaughterhouse
Participant 27	M	Soc Son - Slaughterhouse
Participant 8	M	ILRI
Participant 10	M	Vietnam National University of Agriculture
Participant 28	M	Hung Yen - Tien Lu, pig farmer

Participants were asked to discuss some of the proposed changes to the slaughter process; 1) using clean cloths to wipe each pig, 2) separation of clean and dirty zones, 3) not slaughtering pigs on the floor, and 4) increasing the frequency of cleaning and disinfection.

The group thought that all proposals except the off-floor slaughter were feasible. They said that larger scale slaughterhouses (more than 10 pigs per day) would need to use a hanging system as they thought slaughtering pigs on tables takes longer than on the floor but noted that installing hanging systems would be costly.

The group thought that all of the interventions except cleaning and disinfection should be supported by local authorities and veterinarians, though it was not specified whether this was through financial support or through the provision of advice. The slaughterhouse owners were identified as the people who should encourage workers to increase the frequency of cleaning and disinfection.

They discussed that the planned interventions should not create extra time pressure for the workers. It was discussed that an incentive for the slaughterhouse owners to implement the changes would be to receive additional value for their products from retailer/consumers, and it was acknowledged that for this to occur, there would need to be a way to identify pork that had originated from a 'safer' slaughterhouse.

Group 2. Retailer group: Scaling up

Table 11. Afternoon, group 2, participants

Name	Gender	Place of Work
Participant 29	M	Retailer, Hung Yen
Participant 5	F	Bac Tom
Participant 30	M	Retailer, Hung Yen province

Participant 13	M	Hanoi - Retailers Bac Tom
Participant 31	M	Retailer, Hung Yen
Participant 32	M	Hung Yen - Tien Lu, Slaughterhouse

The group discussed the use of food safety pledges, for example;

'I pledge to sell pork meat that is handled hygienically'

'I am committed to sell pork meat hygienically'

It was discussed that local authorities, such as veterinarians and animal health inspectors, would be needed to regulate retailers using pledges or wearing badges/aprons which indicate safer practice.

The group said that they did not think people would copy the pledges or wear badges/aprons indicating safe practice if they were not doing so as they thought this would risk damaging business and reputation by violating retailers in this way.

The group thought that creating a retailer network for peer-to-peer training and regulation of food safety and hygiene practice would not be effective due to the competitive nature of individual retails with each other.

The group also discussed three suggested interventions; 1) using hygienic cutting boards, 2) not wiping meat with dirty cloths, and 3) regular cleaning of hands and equipment with water, disinfectant or detergent.

The first intervention was thought to be most feasible because all retailers have to use cutting boards for their business and the cleanliness of a cutting board will affect the judgement of customers on the safety of the pork.

It was discussed that retailers use one or two pieces of old cotton cloth or mosquitoes nets for wiping meat. The dirty cloths will be washed and reused the next day. This practice is considered convenient and economical. Despite the relatively low cost to purchase new cloth, retailers perceived that buying new cloths and using different pieces of cloths for wiping different pieces of meat would be costly and time-consuming, especially for the retailers with a low throughput (those who sell only a half or a third of a pig per day).

The third intervention (regular cleaning of hands and equipment) was not considered to be feasible in many small markets as there is often no access to running water. In some larger traditional markets (organized on a regular basis, have a permanent place and a management board) running water is usually available but access points are not always close enough to the retailer for convenient use (as they cannot or do not want to walk away from their stall).

Group 3. The customer perspective

Table 12. Afternoon, group 3, participants

Name	Gender	Place of Work
Participant 17	M	National Institute of Animal Sciences
Participant 11	F	National Institute of Animal Sciences
Participant 6	M	Vietnam National University of Agriculture

Participant 21	F	Vietnam National University of Agriculture
Participant 2	F	Vietnam National University of Agriculture
Participant 22	M	Hanoi University of Public Health
Participant 23	M	Hanoi University of Public Health
Participant 3	M	Vietnam National University of Agriculture
Participant 9	F	National Institute of Animal Sciences

The group discussed that they each bought pork from one to two retailers.

They discussed that the presence of posters in retail outlets would make them question the source and accuracy of the information on the posters.

The group thought that pledges/logos/aprons would prompt customers to ask the retailer for more information about pork safety (e.g. who gave you the poster/logo/apron? Is your meat different from other retailers?), but they believed that if numerous symbols were used then the effect could be lost and thought of as a general advertising campaign and be confusing to the customers.

The group thought that customers could encourage retailers to implement safer measures by communicating to the retailers that the reason for their returning business, or willingness to pay a higher price for pork, is due to concerns over pork safety. If the retailers are able to generate business through selling safer pork, this would act as an incentive for better practice.

Additional poster feedback

The feedback from afternoon participants on the nudge posters was broadly similar to the morning participants. Again, participants reported that the posters using cartoons had no effect, and they said that photographs should be used that contained images which were specific to the local context. The majority of participants preferred the posters with positive framing, especially in the retail group where there were concerns that negatively framed posters could deter customers.

Conclusions and next steps

Generally, the slaughterhouse workers and retailers appeared to be aware of the issues surrounding food borne disease in their industry, highlighting, during the discussions, many of the key points in the pork production chain where meat contamination with microorganisms occurs. However, one point which was raised several times by the groups was the need to wipe meat dry, as it was thought that this process *prevented* meat from spoiling and discoloring, which in normal circumstances is not true. It is unlikely that it will be possible to stop this behavior, and therefore interventions at this point will need to focus on adapting the behavior, such as by providing the opportunity to use clean reusable or disposable cloths.

The concept of using posters to display information in an attempt to change actor's behavior was well received by both the slaughterhouse and retailer groups. Both positive and negative framing of information was thought to be effective, the choice of which dependent on the target audience. However, participant scores of the negatively framed posters were found to be statistically greater than the positively framed posters, indicating a greater anticipated effect on actor's

behavior. All participants discussed the need to have site specific photos to reflect the real context of the setting to increase engagement with the media. When considering the colors to be used for posters; red was considered to be the 'dirtiest' color, while yellow, orange, and purple were considered to be more neutral. Additionally, yellow was thought to be useful as it is bright therefore noticeable. Green and blue were found to be associated with cleanliness, and participants thought they could act as encouragement for better practice. Of the arrows and footprints discussed, two symbols were chosen (one arrow and one footprint) as being the most visually effective.

When considering the practicalities of implementing the nudges into the working environment, participants thought that media such as posters and arrows would need to be bright and large enough to be noticed in what can often be busy, and in the case of the slaughterhouses, dark environments. It was suggested that posters be A-1 in size and placed at multiple points along the production/retail system. The group did not discuss how footprints/arrows could be introduced to the working environment (as part of interventions to change workflows) so the practicality of this nudge would need further investigation.

The group thought that the prospect of upscaling nudges to a broader audience of retailers and consumers could be implemented but would need to be supported by competent food safety authorities.

Recommended next steps:

Once the interventions to be trialed have been chosen by the SafePORK team, site specific nudges, which at this stage are likely to be in the form of informational posters, can be created based on the findings from this workshop. The nudges will then be tested in the field to allow assessment on their ability to impact on pork value chain actor's behavior.

Further investigation, such as trialing the use of footprints and arrows in slaughterhouse environments is needed to ascertain the practicality of using these nudge concepts to designate clean and dirty zones within a confined area.

Appendices

Appendix I–List of attendees

Name	Gender	Place of Work
Barbara Haesler	F	Royal Veterinary College, UK
Chi Nguyen	F	ILRI
Dang Vu Hoa	M	National Institute of Animal Sciences
Dao Duy Dong	M	Retailer, Hung Yen
Duong Van Nhiem	M	Vietnam National University of Agriculture
Fred Unger	M	ILRI
Hoàng Thị Tâm	F	Bac Tom
Hung Nguyen	M	ILRI
Huynh Thi Thanh Binh	F	Department of Animal Health, Vietnam
Karl Rich	M	ILRI
Le Thi Thanh Huyen	F	National Institute of Animal Sciences
Luong Thanh Hai	M	Hoa Binh - Livestock Production & Animal Health Dept.
Marisa Mitchell	F	ILRI
Matthew Hennessey	M	Royal Veterinary College, UK
Minh Thao	M	Hanoi - Retailers Bac Tom
Nguyen Ba An	M	Hung Yen - Tien Lu, Slaughterhouse
Nguyen Huu Nhuan	M	Vietnam National University of Agriculture
Nguyen Huu Quang	M	Retailer, Hung Yen province
Nguyen Mai Trang	F	Wageningen University
Nguyen Thi Duong Nga	F	Vietnam National University of Agriculture

Nguyễn Thị Hoa	F	Hung Yen - Livestock Dept, DARD
Nguyen Thi Thanh An	F	Australian Center for International Agricultural Research
Nguyen Thi Thu Huyen	F	Vietnam National University of Agriculture
Nguyen Van Ha	M	Soc Son - Slaughterhouse
Nguyen Van Luc	M	Hanoi - Retailers Bac Tom
Nguyen Van Quan	M	Hanoi University of Public Health
Nguyen Van Tuan	M	Hoa Binh - Livestock Production & Animal Health Dept.
Pham Duc Phuc	M	Hanoi University of Public Health
Pham Van Hung	M	Vietnam National University of Agriculture
Phung Van Nhat	M	Soc Son - Slaughterhouse
Shirley Tarawali	F	ILRI
Sinh Dang	M	ILRI
Thanh Nguyen	F	ILRI
Thinh Nguyen	F	ILRI
Tran Dinh Tu	M	Retailer, Hung Yen
Tran Thi Bich Ngoc	F	National Institute of Animal Sciences
Tran Van Long	M	Vietnam National University of Agriculture
Truong Quang Tien	M	Hanoi University of Public Health
Vu Minh Chien	M	Hung Yen - Tien Lu, pig farmer
Vu Xuan Thuy	M	Hung Yen - Tien Lu, Slaughterhouse
Vuong Dac Hung	M	DARD, Hoa Binh province

Appendix 2–Meeting programme



Workshop

Exploring Behavioural Economics: Using ‘Nudge Theory’ to improve the effectiveness of SAFE Pork interventions in Vietnam

Date: 27th Nov 2018

Location: Pullman, 40, Cát Linh, Đống Đa, Hà Nội 10000, Vietnam

Agenda

27 th November	Activity	Methods, presenter/chair
8:30 – 9:00	Registration	
9:00 – 9:15	Opening remarks	Shirley Tarawali (ILRI ADG)
9.15 – 10:00	Objectives and introduction (5min) SAFE Pork overview (10min) Nudge theory: Introduction to behavioural economics (15 min) Nudges in the proposed interventions (15min)	Dr Barbara Haesler (RVC), Mathew Hennessey & Dr Fred Unger (ILRI)
10:00-10:30	Activity on behaviour changes in slaughter houses (4 groups)	4 facilitators
10:30	Coffee break	
10:50 – 11:10	Feedback from 1 st group discussion	Dr Fred Unger/Dr Barbara Haesler
11:10 – 12:10	Using Nudges to support interventions: Small group discussions (4 groups)	4 facilitator & 4 note taker
12:10 – 12:40	Feedback & discuss group findings	
12:40 – 14:00	Lunch	
14:00 – 17:00 (in between coffee break)	Using Nudges within the Pork Value Chain (PVC) Group discussion with PVC actors (Slaughter, retailer)	Dr Barbara Haesler Two groups/two facilitators
17:00 – 17:30	Plenary discussion of group findings Summary and conclusion	Dr Fred Unger/Dr Barbara Haesler

Appendix 3–Guidance for facilitators

Guidance for facilitators, SafePORK workshop, 27 November 2018, Hanoi

Activity 1 (table on slaughterhouse processes and slaughterhouse worker behaviour)

	Group 1 Avoidance of floor slaughter	Group 2 Separation of clean and dirty zones	Group 3 Not wiping carcass with dirty cloth	Group 4 Cleaning and/or disinfection during slaughter
Investment / infrastructure to be provided	Provision of 1) Grids, and/or 2) Tables, and/or 3) Hanging system	Establishment of new processes Demarcation Training	Provision of relevant materials Training	Provision of relevant materials Training
Question 1	What is the current slaughter process?	What are the current processes and flows and is there a separation?	What is currently done and how (i.e. carcass wiping with cloth)?	What cleaning and disinfection is currently done?
Question 2	How could the current slaughter process be improved?	What (further) separation should there be/what would a separation look like?	What other practice could be used instead?	How could cleaning and disinfection during slaughter be improved?
Question 3	To move to another system (e.g. to change from floor to table or from table to hanging system), what steps/processes would need to change and how?	What would need to change in slaughterhouse for this separation to be possible?	What would need to change in slaughterhouse for this other practice to be possible?	What changes would need to be introduced to make this happen?
Question 4	What would workers need to do differently?	What would workers need to do differently?	What would workers need to do differently?	What would workers need to do differently?
Summary	Summary: What is the desired behaviour change of slaughterhouse workers?			

Steps

1. Quick introduction of people in your group
2. Explain that the focus is not on the provision of infrastructure or the training that is needed, but that we want to understand the underlying processes and how these need to be changed. This is then used as a basis to understand what behaviors we need to change.
3. Guide the group through the questions; encourage them to move on so that they answer all the questions
4. Encourage all group members to participate in this activity

Activity 2 (4 stations)

Station 1: slaughterhouse posters for off-floor slaughtering

Station 1: Slaughterhouse posters

- > Posters for slaughterhouse
 - Cartoons, pictures of meat, pictures of people
 - Positive and negative framing
 - Different colours
- > Your task
 - Use scoring sheets provided; give individual scores
 - Compare your scores and explain your scores to your colleagues: *Is the message salient? What associations and feelings do these prints create? Why?* Discuss agreements and disagreements.
 - Discuss how the posters could be improved
 - Discuss where in the slaughterhouse such poster(s) should be placed for maximum effect and what size they should have




Steps:

1. Hand out the scoring sheets
2. Encourage people to look at the prints and then complete the scoring sheet without talking.
3. After a few minutes, ask people to share their scores and explain why they gave these scores
4. Ask the group to answer the following questions:
 - *Is the message salient?*
 - *What associations and feelings do these prints create? Why?* (prompts: picture, cartoon, with or without people in it, the use of colours, the use of slogans)
 - Let them talk about differing viewpoints, agreements, disagreements, encourage discussion
 - Ask them whether they have suggestions for improving the posters.
5. Ask the group to discuss where in the slaughterhouse such poster(s) should be placed for maximum effect and what size they should have

Station 2: retailer posters for cleaning

Station B: Retailer posters for washing

- > Posters for retailers
 - Cartoons, pictures of meat, pictures of people
 - Positive and negative framing
 - Different colours
- > Your task
 - Use scoring sheets provided for Station B; give individual scores
 - Compare your scores and explain your scores to your colleagues: *Is the message salient? What associations and feelings do these prints create? Why?* Discuss agreements and disagreements.
 - Discuss how the posters could be made more effective
 - Discuss where in the slaughterhouse such poster(s) should be placed for maximum effect and what size they should have




Steps:

1. Hand out the scoring sheets
2. Encourage people to look at the prints and then complete the scoring sheet without talking.
3. After a few minutes, ask people to share their scores and explain why they gave these scores
4. Ask the group to answer the following questions:
 - *Is the message salient?*
 - *What associations and feelings do these prints create? Why?* (prompts: picture, cartoon, with or without people in it, the use of colours, the use of slogans)
 - Let them talk about differing viewpoints, agreements, disagreements, encourage discussion
 - Ask them whether they have suggestions for improving the posters.
5. Ask the group to discuss where in the slaughterhouse such poster(s) should be placed for maximum effect and what size they should have

Station C: Retailer – combination of information

Station C: Retailer combination of messages

- > Identification of suitable combination of messages
 - Use of checkboxes
 - Combined pictures in one poster without checkboxes
- > Your task
 - Look at the suggestions provided and comment on their effectiveness
 - Discuss what combination of information (with checkboxes, with pictures, cartoons, etc) would be most effective and why
 - Discuss where in the retailer the posters should be placed for maximum effect and what size they should have



Steps

1. Encourage people to look at the prints and reflect on how different information could be combined in one poster
2. Ask people in the group what combination of information (with checkboxes, with pictures, cartoons, etc.) would be most effective and why.
 - a. Also aim to explore the following:
 - i. Do the checkboxes encourage the right behavior?
 - ii. Should the poster focus on provision of information or making a commitment?
 - iii. How will consumer react to the poster?
 - iv. Is a reaction from customers desirable/ desired?
 - v. What will be the reaction of other retailers?
3. Ask the participants where in the retailer the posters should be placed for maximum effect and what size they should have

Station D: Slaughterhouse – demarcation

Station D: Demarcation of clean / dirty areas

- > Identification of workflow and clean / dirty areas
 - How can the required flows be marked?
 - How can the clean / dirty areas be marked?
 - What signs and colours are most effective?
 - Where should they be placed?
- > Your task
 - Look at the symbols provided and rank them in order of effectiveness using the scoring sheet for Station D
 - Compare your ranks and explain your ranks to your colleagues: *What symbols appear to be more effective and why? What is the effect of the colours used?* Discuss agreements and disagreements.
 - Discuss where in the slaughterhouse the symbols should be placed for maximum effect and what size they should have
 - Discuss how clean and dirty areas in the slaughterhouse could be demarcated effectively
 - Discuss whether symbols are enough or should be supported by words

Logos on the right side of the poster include: ILRI (International Livestock Research Institute), CGIAR (Global Crop Improvement Gateway), BACTOM (Bacterial Action Tool for Meat and Poultry), and Royal Holloway College.

Steps

1. Hand out the scoring sheets
2. Encourage people to look at the prints and then complete the scoring sheet without talking.
3. After a few minutes, ask people to share their scores and explain why they gave these scores
4. Ask the group to answer the following questions:
 - *What symbols appear to be more effective and why?*
 - *What is the effect of the colors used?*
 - *Where in the slaughterhouse the symbols should be placed for maximum effect and what size they should have?*
 - *How can clean and dirty areas in the slaughterhouse be demarcated effectively?* Prompts: lines, physical barriers, different surfaces, colors, etc.

- Are symbols enough or should they be supported by words
- Let them talk about differing viewpoints, agreements, disagreements, encourage discussion
- Ask them whether they have suggestions for improving the posters.

Additional afternoon activities

Social norms (slaughterhouse group)

Slaughterhouse group (IV): Social norms

In your groups, discuss the following questions:

- > Are the proposed changes feasible? Why?
- > What do you think will motivate people most to change their behaviour? Why?
- > How could such changes be sustained over time?
- > Who should create and initiate such changes? Why?
- > Who should provide training for this to be most effective? Why?
- > How could these changes be scaled-up (to other slaughterhouses), what mechanisms would help with dissemination and uptake?

Logos on the right side of the slide include: ILRI, CGIAR Research Program on Agriculture for Nutrition and Health, FAO, BACTOM, BIOSPRING, and Royal Veterinary College.

Open group discussion to go through the following questions:

- Are the proposed changes feasible? Why?
- What do you think will motivate people most to change their behavior? Why?
- How could such changes be sustained over time?
- Who should create and initiate such changes? Why?
- Who should provide training for this to be most effective? Why?
- How could these changes be scaled-up (to other slaughterhouses), what mechanisms would help with dissemination and uptake?

Your role as facilitator:

- Create an environment that ensures that everybody feels comfortable and can contribute / express their opinion
- Keep the discussion flowing without imposing your opinion
- Prompts: Encourage people to think about
 - Did they introduce changes in the past?
 - What worked, did not work?
 - What are lessons to be learned for this situation?
 - How are they influenced by others? Do they react differently to different people? In what way? How does that influence training provision?
 - How do slaughterhouses communicate with each other? Would a system of peer-support be effective? In what way?

Retailer group: Scaling up

Retailer group (IV): Scaling up

- › Scaling up:
 - What would you think about the use of a pledge, e.g. *I pledge to sell pork meat that is handled hygienically*. What would make you commit to something like this?
 - What would you think about wearing a badge or apron, e.g. *I am committed to sell pork meat hygienically*. What would make you commit to something like this?
 - With the above, what mechanisms could be implemented to avoid people copying the badge or apron without implementing the hygiene measures?
 - How could a retailer network for peer-training and regulation or control be created? What would be the role of local champions?
 - How would such a pledge / badge or similar affect the relationship with consumers?

Logos on the right side of the slide include: ILRI, CODE (International Agricultural Research for Nutrition and Health), BACTOM (Check that you're safe), BIOSPRING, and Royal Veterinary College.

Open group discussion to go through the following questions:

1. What would you think about the use of a pledge, e.g. I pledge to sell pork meat that is handled hygienically. What would make you commit to something like this?
2. What would you think about wearing a badge or apron, e.g. I am committed to sell pork meat hygienically. What would make you commit to something like this?
3. With the above, what mechanisms could be implemented to avoid people copying the badge or apron without implementing the hygiene measures?
4. How could a retailer network for peer-training and regulation or control be created? What would be the role of local champions?
5. How would such a pledge / badge or similar affect the relationship with consumers?


Your role as facilitator:

6. Create an environment that ensures that everybody feels comfortable and can contribute / express their opinion
7. Keep the discussion flowing without imposing your opinion
8. Prompts: Encourage people to think about
 - The influence of
 - Other people doing it, role models, champions, competitors
 - Customers asking for it
 - Rewards (more customers, being part of a network, security)
 - Reputation
 - Lessons learned from the past
 - The relationships with colleagues and customers
 - The risks of implementing such systems – unintended consequences

The customer perspective

The customer perspective

- > In your role as customer at a retailer, discuss the following
 - What would be your reaction to posters like that at retail level?
 - What would be your reaction to a pledge, a logo, an apron or similar structured commitments?
 - What would you ask/say to your retailer?
 - Would other customers have a reaction similar to yours?
 - If your retailer was taking part in such a scheme to improve hygienic handling of meat, how would this affect
 - Your trust in your retailer?
 - Your trust in the safety of the meat you are purchasing?
 - Why?
 - Can you think of ways customers could help to encourage retailers to implement safer measures?
 - What are they and how feasible are they?
 - What are barriers to uptake?
 - How would the retailers react to your suggestions?



Open group discussion to go through the following questions:

In your role as customer at a retailer, discuss the following

1. What would be your reaction to posters like that at retail level?
2. What would be your reaction to a pledge, a logo, an apron or similar structured commitments?
3. What would you ask/say to your retailer?
4. Would other customers have a reaction similar to yours?
5. If your retailer was taking part in such a scheme to improve hygienic handling of meat, how would this affect
 - Your trust in your retailer?
 - Your trust in the safety of the meat you are purchasing?
 - Why?
6. Can you think of ways customers could help to encourage retailers to implement safer measures?
 - What are they and how feasible are they?
 - What are barriers to uptake?
- How would the retailers react to your suggestions?

Your role as facilitator:

9. Create an environment that ensures that everybody feels comfortable and can contribute / express their opinion
10. Keep the discussion flowing without imposing your opinion
11. Prompts: During the discussion, encourage people to think about
 - Previous experiences – how did they react?
 - What makes them loose or gain trust in the retailer and safety of the pork? Why?
 - Would they trust it more if fewer or more retailer had it?
 - How would they feel about something that is managed exclusively by retailers (as opposed to authorities)?
 - What is the relationship they have with their retailers? Why do they prefer one over the others? Would such a scheme change that?

A-1

We promote safer pork



by not slaughtering on the floor

A-2

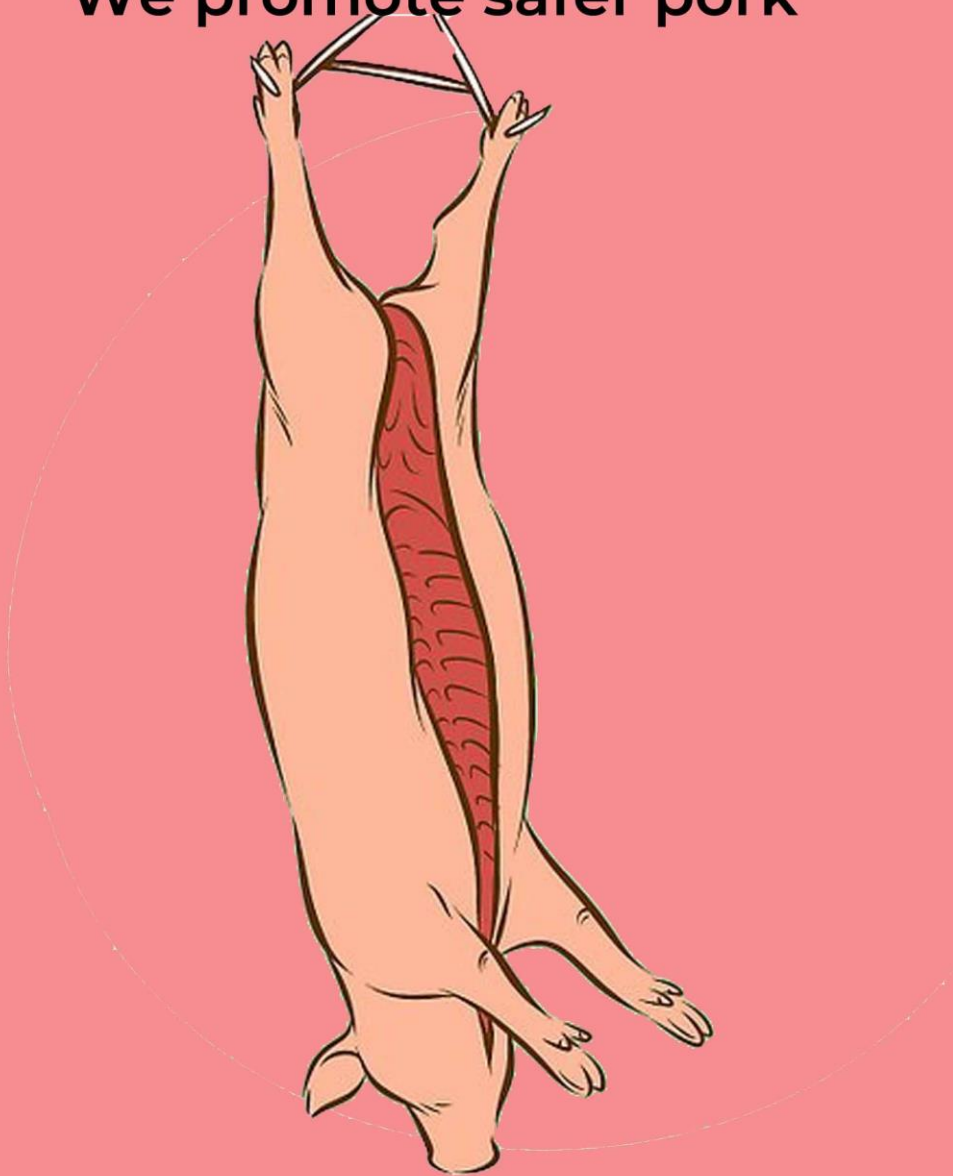
We promote safer pork



by not slaughtering on the floor

A-3

We promote safer pork



by not slaughtering on the floor

A-4

Slaughtering on the floor



**increases the risk of contaminated
pork**

A-5

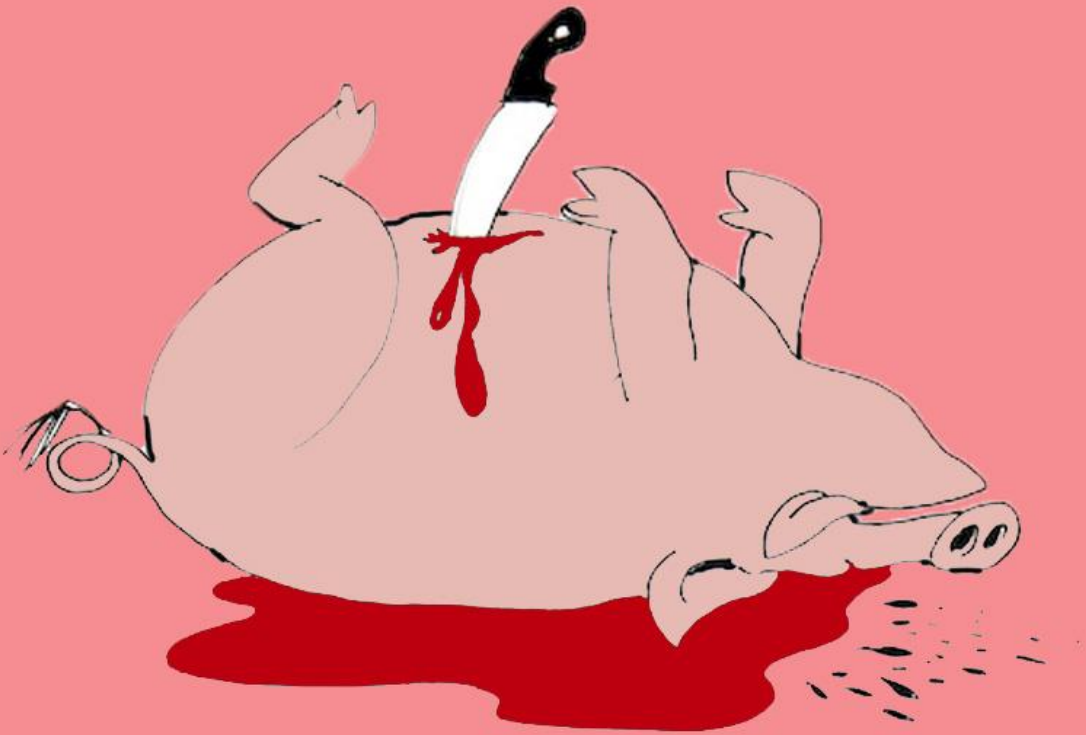
Slaughtering on the floor



**increases the risk of contaminated
pork**

A-6

Slaughtering on the floor



**increases the risk of contaminated
pork**

A-7

**Not slaughtering on the
floor**



promotes safer pork

A-8

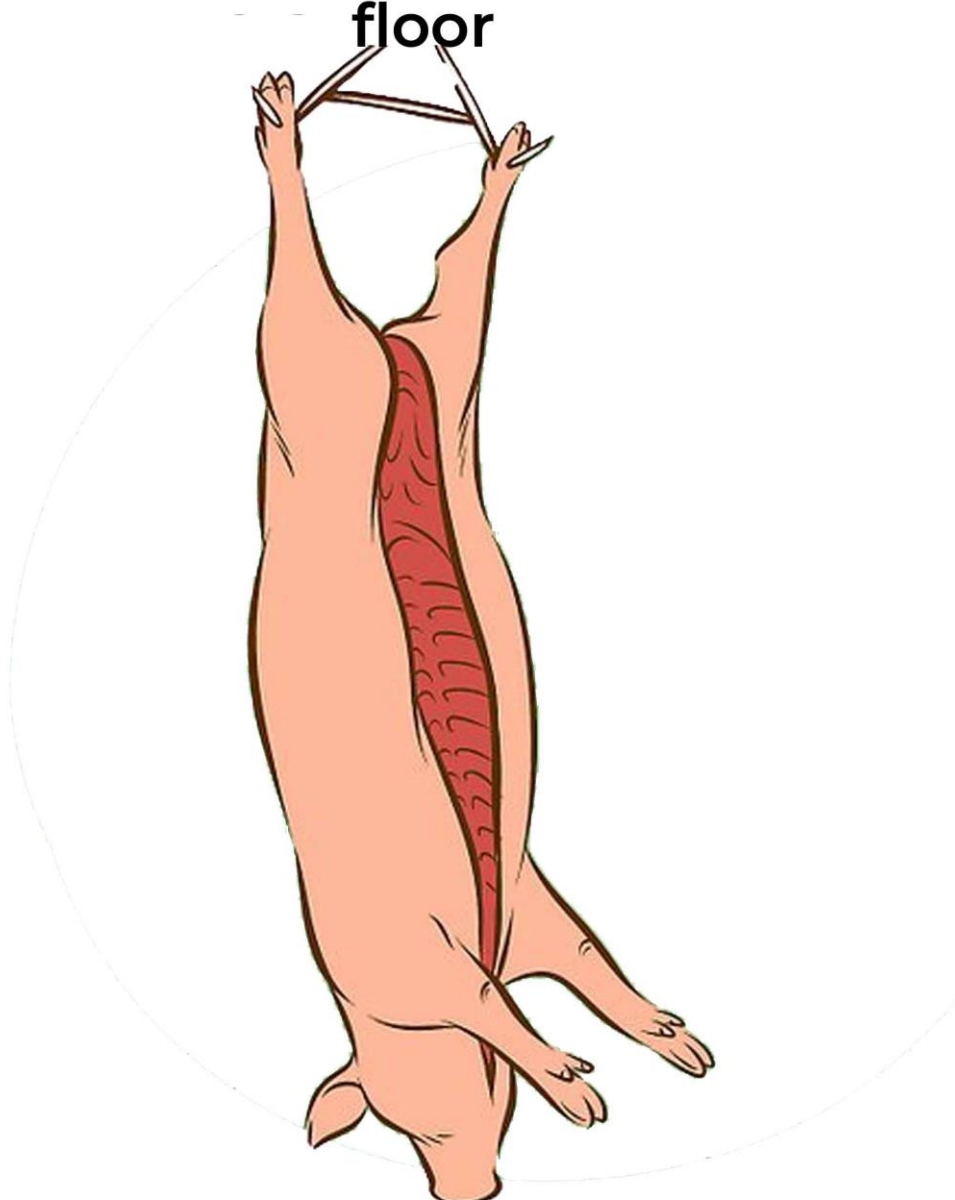
**Not slaughtering on the
floor**



promotes safer pork

A-9

**Not slaughtering on the
floor**



promotes safer pork

B-1

We promote safer pork



**by properly cleaning our hands
and equipment**

B-2

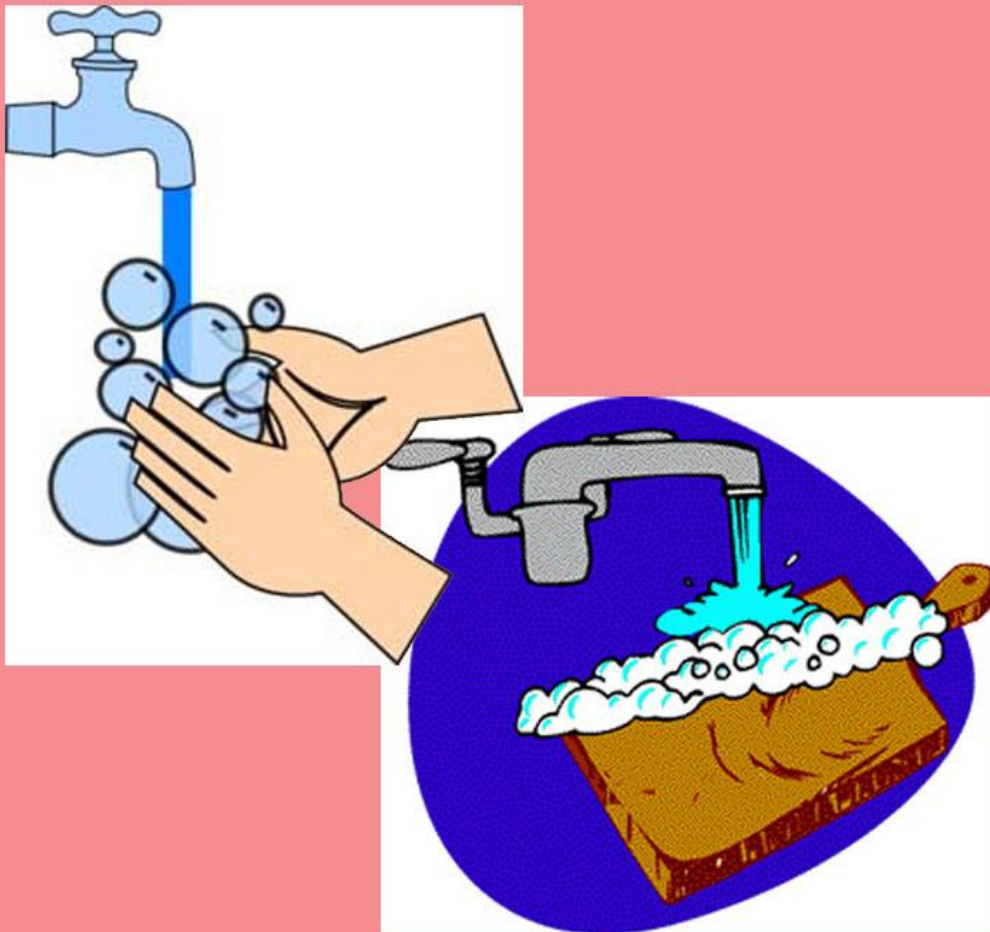
We promote safer pork



**by properly cleaning our hands
and equipment**

B-3

We promote safer pork



**by properly cleaning our hands
and equipment**

B-4

Properly cleaning your hands and equipment



promotes safer pork'

B-5

**Properly cleaning your
hands and equipment**



promotes safer pork

B-6

**Properly cleaning your
hands and equipment**



promotes safer pork

B-7

Dirty hands and equipment



leads to contaminated meat

B-8

Dirty hands and equipment



leads to contaminated meat

C-1

We promote safer pork

- ✓ I use hygienic cutting boards



- ✓ I do not wipe meat with dirty cloths



- ✓ I regularly clean my equipment with hot water and disinfectant



C-2

We promote safer pork

I use hygienic chopping boards

I do not wipe meat with dirty cloths

I regularly clean my equipment with hot water and disinfectant



C-3

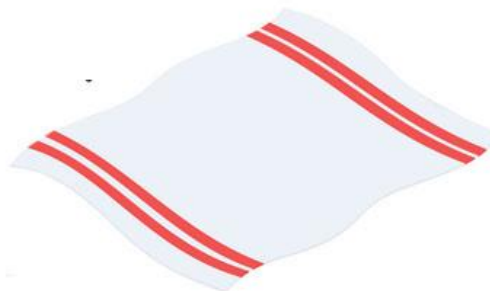
We promote safer pork



I use hygienic chopping boards



I do not wipe meat with dirty cloths



I regularly clean my equipment with hot water and disinfectant



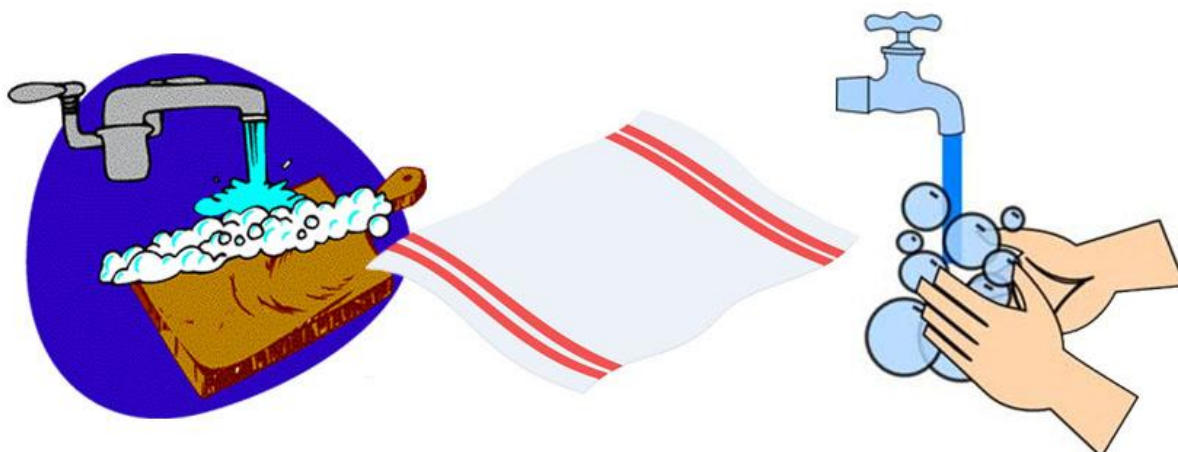
C-4

We promote safer pork

I use hygienic
chopping boards

I do not wipe meat with
dirty cloths

I regularly clean my equipment
with hot water and
disinfectant



Appendix 5–Poster scoring sheet

Stakeholder Workshop

Poster scoring sheet

Please score the posters that are on display. The number on each poster corresponds to the numbers below.

A. Do you think the poster will make slaughterhouse workers more or less likely to slaughter pigs on the floor?

Poster A1



A lot less likely Less likely Slightly less likely No effect Slightly more likely More likely A lot more likely

Corresponding score (not included on the sheet given to participants)

1 2 3 4 5 6 7

B. Do you think the poster will make pork retailers more or less likely to properly clean their hands and equipment?

Poster B1



A lot less likely Less likely Slightly less likely No effect Slightly more likely More likely A lot more likely

Corresponding score (not included on the sheet given to participants)

1 2 3 4 5 6 7

Appendix 6 –Colour and arrow scoring sheet

Stakeholder Workshop

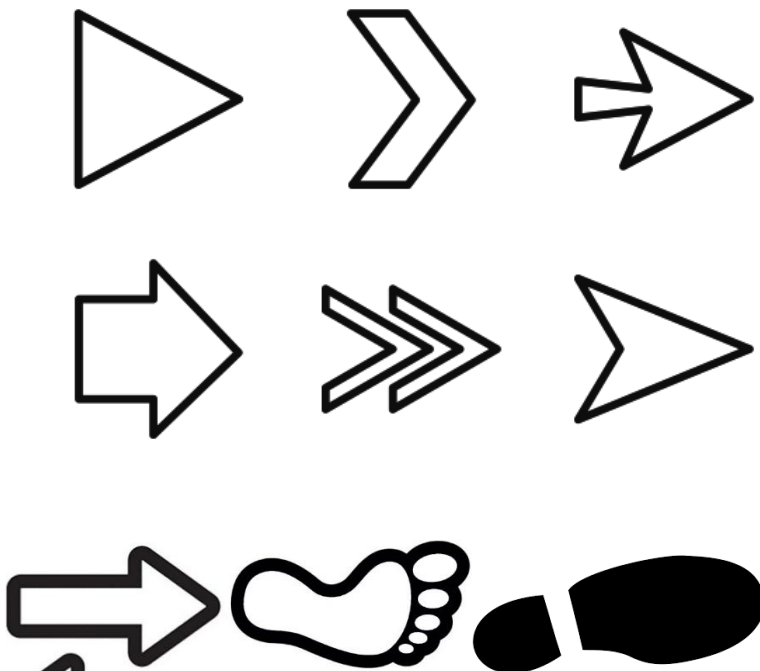
Arrows and footprints – participant scoring sheet

A. Please rank the following colors from dirty to clean.

Dirty Clean

		DARK BLUE	RED		YELLOW	
		ORANGE			LIGHT BLUE	
1. _____	2. _____	GREEN	4. PURPLE	5. _____	6. _____	7. _____

B. Please select which arrow or footprint you think would be best at persuading people to go in a certain direction:



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