***Supplementary Appendix of Benefits and Risks of Smallholder Livestock Production on Child Nutrition in Low- and Middle- Income Countries (LMIC)***

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\*Search strategies for additional databases available from corresponding author upon request

# Supplementary information 1

## Sample (PubMed) search strategies for questions studying benefits of smallholder livestock production

### Search strategy for question 1

(("Livestock"[Mesh] OR "Poultry"[Mesh] OR "Sheep, Domestic"[Mesh] OR "Buffaloes"[Mesh] OR "Reindeer"[Mesh] OR "Goats"[Mesh] OR "Columbiformes"[Mesh] OR "Anseriformes"[Mesh] OR "Galliformes"[Mesh] OR "Chickens"[Mesh] OR "Turkeys"[Mesh] OR "Camelidae"[Mesh] OR "Rabbits"[Mesh] OR "Horses"[Mesh] OR "Guinea Pigs"[Mesh] OR "farm animal\*"[tiab] OR "domestic animal\*"[tiab] OR "domesticated animal\*"[tiab] OR livestock[tiab] OR horse\*[tiab] OR donkey\*[tiab] OR cattle[tiab] OR cow[tiab] OR cows[tiab] OR ox[tiab] OR oxen[tiab] OR zebu\*[tiab] OR bali\*[tiab] OR yak[tiab] OR yaks[tiab] OR "water buffalo\*"[tiab] OR gayal\*[tiab] OR sheep\*[tiab] OR goat\*[tiab] OR reindeer\*[tiab] OR pig[tiab] OR pigs[tiab] OR hog[tiab] OR hogs[tiab] OR swine[tiab] OR chicken\*[tiab] OR duck\*[tiab] OR poultr\*[tiab] OR geese[tiab] OR goose[tiab] OR buffalo\*[tiab] OR "domestic fowl\*"[tiab] OR fowl\*[tiab] OR camel\*[tiab] OR llama\*[tiab] OR alpaca\*[tiab] OR rabbit\*[tiab] OR "guinea pig\*"[tiab] OR turkey\*[tiab] OR pigeon\*[tiab] OR porcine[tiab] OR bovine\*[tiab] OR mule\*[tiab] OR foal\*[tiab] OR calf[tiab] OR calves[tiab] OR gosling\*[tiab] OR duckling\*[tiab] OR piglet\*[tiab]) **AND** ("Animal Husbandry"[Mesh] OR smallhold\*[tiab] OR "small hold\*"[tiab] OR "small-hold\*"[tiab] OR "small-scale farm\*"[tiab] OR "small scale farm\*"[tiab] OR "small-scale agriculture\*"[tiab] OR "small scale agriculture\*"[tiab] OR subsistence[tiab] OR "subsistence farm\*"[tiab] OR "subsistence farming"[tiab] OR "family farm"[tiab] OR "pastoral"[tiab] OR "herding"[tiab] OR "agro-pastoral"[tiab] OR "agropastoral"[tiab] OR "agro pastoral"[tiab])) **AND** (("Feeding Behavior"[Mesh] OR "Food Preferences"[Mesh] OR "Diet, Healthy"[Mesh] OR "Breast Feeding"[Mesh] OR "diversified diet\*" [tiab] OR "varied diet\*" [tiab] OR "infant and young child feeding practice\*"[tiab] OR "dietary diversity"[tiab] OR "dietary intake"[tiab] OR "complementary feeding"[tiab] OR "breast feed\*"[tiab] OR breastfeed\*[tiab] OR "breast fed"[tiab] OR "diet pattern\*"[tiab] OR "dietary pattern\*"[tiab] OR "complementary feeding"[tiab] OR "feeding behavior"[tiab]) **AND** ("Meat"[Mesh] OR "Meat Products"[Mesh] OR "Red Meat"[Mesh] OR "Pork Meat"[Mesh] OR "Meat Proteins"[Mesh] OR "Poultry"[Mesh] OR "Poultry Products"[Mesh] OR "Poultry Proteins"[Mesh] OR "Dietary Proteins"[Mesh] OR "Animal Proteins, Dietary"[Mesh] OR "Egg Proteins, Dietary"[Mesh] OR "Milk"[Mesh] OR "Milk Proteins"[Mesh] OR "animal source food\*"[tiab] OR "ASF"[tiab] OR "animal source food consumption"[tiab] OR "ASF consumption"[tiab] OR milk[tiab] OR egg[tiab] OR eggs[tiab] OR meat\*[tiab] OR beef[tiab] OR mutton[tiab] OR lamb[tiab] OR pork[tiab] OR protein[tiab] OR "vitamin A"[tiab] OR "vitamin B12"[tiab] OR "essential fatty acid\*"[tiab] OR macronutrient\*[tiab] OR micronutrient\*[tiab] OR "dietary supplement\*"[tiab] OR "infant nutrition"[tiab] OR "child nutrition"[tiab] OR "infant and child nutrition"[tiab] OR "animal food product\*"[tiab] OR nutrition[tiab] OR offal[tiab] OR poultry[tiab] OR "poultry product\*"[tiab] OR "poultry protein\*"[tiab] OR "meat product\*"[tiab] OR "meat protein\*"[tiab] OR "pork meat\*"[tiab] OR "red meat\*"[tiab] OR "dietary protein\*"[tiab] OR "milk protein\*"[tiab])) AND (2000:2021[pdat]) AND (english[Filter])

Additional databases searched: **CABI** andEbscosHost’s **Academic Search Premier** and **CINAHL** (Cumulative Index of Nursing and Allied Health Information).

### Search strategy for question 2

(("Livestock"[Mesh] OR "Poultry"[Mesh] OR "Sheep, Domestic"[Mesh] OR "Buffaloes"[Mesh] OR "Reindeer"[Mesh] OR "Goats"[Mesh] OR "Columbiformes"[Mesh] OR "Anseriformes"[Mesh] OR "Galliformes"[Mesh] OR "Chickens"[Mesh] OR "Turkeys"[Mesh] OR "Camelidae"[Mesh] OR "Rabbits"[Mesh] OR "Horses"[Mesh] OR "Guinea Pigs"[Mesh]) OR "farm animal\*"[tiab] OR "domestic animal\*"[tiab] OR "domesticated animal\*"[tiab] OR livestock[tiab] OR horse\*[tiab] OR donkey\*[tiab] OR cattle[tiab] OR cow[tiab] OR cows[tiab] OR ox[tiab] OR oxen[tiab] OR zebu\*[tiab] OR bali\*[tiab] OR yak[tiab] OR yaks[tiab] OR "water buffalo\*"[tiab] OR gayal\*[tiab] OR sheep\*[tiab] OR goat\*[tiab] OR reindeer\*[tiab] OR pig[tiab] OR pigs[tiab] OR hog[tiab] OR hogs[tiab] OR swine[tiab] OR chicken\*[tiab] OR duck\*[tiab] OR poultr\*[tiab] OR geese[tiab] OR goose[tiab] OR buffalo\*[tiab] OR "domestic fowl\*"[tiab] OR fowl\*[tiab] OR camel\*[tiab] OR llama\*[tiab] OR alpaca\*[tiab] OR rabbit\*[tiab] OR "guinea pig\*"[tiab] OR turkey\*[tiab] OR pigeon\*[tiab] OR porcine[tiab] OR bovine\*[tiab] OR mule\*[tiab] OR foal\*[tiab] OR calf[tiab] OR calves[tiab] OR gosling\*[tiab] OR duckling\*[tiab] OR piglet\*[tiab]) **AND** ("Animal Husbandry"[Mesh OR smallhold\*[tiab] OR "small hold\*"[tiab] OR "small-hold\*"[tiab] OR "small-scale farm\*"[tiab] OR "small scale farm\*"[tiab] OR "small-scale agriculture\*"[tiab] OR "small scale agriculture\*"[tiab] OR subsistence[tiab] OR "subsistence farm\*"[tiab] OR "subsistence farming"[tiab] OR "family farm"[tiab] OR "pastoral"[tiab] OR "herding"[tiab] OR "agro-pastoral"[tiab] OR "agropastoral"[tiab] OR "agro pastoral"[tiab])) **AND** (income [tiab] OR "income generation" [tiab] OR "household income" [tiab] OR "economic status" [tiab] OR poverty [tiab] OR wealth [tiab] OR asset\* [tiab] OR livelihood\* [tiab] OR "household livelihood\*" [tiab] OR "livelihood generation" [tiab]) **AND** ("infant and young child feeding practice\*"[tiab] OR diet[tiab] OR "dietary diversity"[tiab] OR "dietary intake\*"[tiab] OR "diet intake"[tiab] OR "diet pattern\*"[tiab] OR "dietary pattern\*"[tiab] OR "complementary feeding"[tiab] OR "supplementation"[tiab] OR "supplement\*"[tiab] OR "infant and child nutrition"[tiab] OR "energy intake"[tiab] OR "feeding behavior\*"[tiab] OR "feeding practice\*"[tiab] OR "diet practice\*"[tiab] OR "dietary practice\*"[tiab] OR "pediatric nutrition"[tiab] OR nutrition[tiab] OR "infant nutrition"[tiab] OR "child nutrition"[tiab] OR consumption[tiab] OR "food consumption"[tiab] OR "diet, food, and nutrition"[tiab]) AND (2000:2021[pdat]) AND (english[Filter])

Additional databases searched: **Agricola, CABI**, EbscoHost’s **Academic Search Premier** and **EconLit**.

### Search strategy for question 3

(("Livestock"[Mesh] OR "Poultry"[Mesh] OR "Sheep, Domestic"[Mesh] OR "Buffaloes"[Mesh] OR "Reindeer"[Mesh] OR "Goats"[Mesh] OR "Columbiformes"[Mesh] OR "Anseriformes"[Mesh] OR "Galliformes"[Mesh] OR "Chickens"[Mesh] OR "Turkeys"[Mesh] OR "Camelidae"[Mesh] OR "Rabbits"[Mesh] OR "Horses"[Mesh] OR "Guinea Pigs"[Mesh] OR "farm animal\*"[tiab] OR "domestic animal\*"[tiab] OR "domesticated animal\*"[tiab] OR livestock[tiab] OR horse\*[tiab] OR donkey\*[tiab] OR cattle[tiab] OR cow[tiab] OR cows[tiab] OR ox[tiab] OR oxen[tiab] OR zebu\*[tiab] OR bali\*[tiab] OR yak[tiab] OR yaks[tiab] OR "water buffalo\*"[tiab] OR gayal\*[tiab] OR sheep\*[tiab] OR goat\*[tiab] OR reindeer\*[tiab] OR pig[tiab] OR pigs[tiab] OR hog[tiab] OR hogs[tiab] OR swine[tiab] OR chicken\*[tiab] OR duck\*[tiab] OR poultr\*[tiab] OR geese[tiab] OR goose[tiab] OR buffalo\*[tiab] OR "domestic fowl\*"[tiab] OR fowl\*[tiab] OR camel\*[tiab] OR llama\*[tiab] OR alpaca\*[tiab] OR rabbit\*[tiab] OR "guinea pig\*"[tiab] OR turkey\*[tiab] OR pigeon\*[tiab] OR porcine[tiab] OR bovine\*[tiab] OR mule\*[tiab] OR foal\*[tiab] OR calf[tiab] OR calves[tiab] OR gosling\*[tiab] OR duckling\*[tiab] OR piglet\*[tiab]) **AND** ("Animal Husbandry"[Mesh] OR smallhold\*[tiab] OR "small hold\*"[tiab] OR "small-hold\*"[tiab] OR "small-scale farm\*"[tiab] OR "small scale farm\*"[tiab] OR "small-scale agriculture\*"[tiab] OR "small scale agriculture\*"[tiab] OR subsistence[tiab] OR "subsistence farm\*"[tiab] OR "subsistence farming"[tiab] OR "family farm"[tiab] OR "pastoral"[tiab] OR "herding"[tiab] OR "agro-pastoral"[tiab] OR "agropastoral"[tiab] OR "agro pastoral"[tiab])) **AND** ("Empowerment"[Mesh] OR "Decision Making, Shared"[Mesh] OR "Gender Role"[Mesh] OR "Personal Autonomy"[Mesh] OR "Interpersonal Relations"[Mesh] OR "Gender Equity"[Mesh] OR "Women's Rights"[Mesh] OR "women's empowerment"[tiab] OR empower\*[tiab] OR "woman's income"[tiab] OR "women's income"[tiab] OR "women's status"[tiab] OR "woman's status"[tiab] OR "decision-making"[tiab] OR "decision making"[tiab] OR "bargaining power"[tiab] OR power[tiab] OR wealth[tiab] OR "extra-domestic"[tiab] OR "gender parity"[tiab] OR "gender equality"[tiab] OR "labor force participation"[tiab] OR "economic participation"[tiab] OR "inclusive development"[tiab] OR autonomy[tiab] OR "women's power"[tiab] OR "women's advancement"[tiab] OR "productive potential"[tiab] OR "male privilege\*"[tiab] OR "access to income"[tiab] OR "contribution to household\* welfare"[tiab] OR agency[tiab] OR "women's agency"[tiab] OR "shared decision making"[tiab] OR "gender role"[tiab] OR "personal autonomy"[tiab] OR "interpersonal relation\*"[tiab] OR "gender equity"[tiab] OR "women's right\*"[tiab] OR "woman's control"[tiab] OR "women's control"[tiab] OR "woman's participation"[tiab] OR "women's participation"[tiab]) AND (2000:2021[pdat]) AND (english[Filter])

Additional databases searched: **CABI** and EbscoHost’s **Academic Search Premier, EconLit** and **Women’s Studies International**.

## Sample (PubMed) search strategies for questions studying risks of smallholder livestock production

### Search strategy for question 1

#### Search strategy for enteric pathogens that are associated with environmental enteric dysfunction (EED): EED

("Sprue, Tropical/epidemiology"[Mesh] OR "Sprue, Tropical/microbiology"[Mesh] OR "Sprue, Tropical/parasitology"[Mesh] OR "Sprue, Tropical/pathology"[Mesh] OR "Sprue, Tropical/physiology"[Mesh] OR "Sprue, Tropical/physiopathology"[Mesh] OR "Sprue, Tropical/prevention and control"[Mesh] OR "environmental enteropath\*"[tiab] OR "environmental enteric dysfunction\*"[tiab] OR "tropical enteropath\*"[tiab] OR "pediatric environmental enteropath\*"[tiab]) AND (2000:2021[pdat]) AND (english[Filter])

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

#### Search strategy for enteric pathogens that are associated with undernutrition outcomes: (Enteric pathogens) AND (infant and children) AND (undernutrition outcomes)

("Gastrointestinal Diseases/epidemiology"[Mesh] OR "Gastrointestinal Diseases/etiology"[Mesh] OR "Gastrointestinal Diseases/microbiology"[Mesh] OR "Gastrointestinal Diseases/parasitology"[Mesh] OR "Gastrointestinal Diseases/prevention and control"[Mesh] OR "Gastrointestinal Diseases/transmission"[Mesh] OR "Gastrointestinal Diseases/virology"[Mesh] OR "Escherichia coli Infections/epidemiology"[Mesh] OR "Escherichia coli Infections/microbiology"[Mesh] OR "Escherichia coli Infections/prevention and control"[Mesh] OR "Escherichia coli Infections/transmission"[Mesh] ) OR "Campylobacter"[Mesh] OR "Cryptosporidium"[Mesh] OR "Giardia"[Mesh] OR "Adenoviridae"[Mesh] OR "Aeromonas"[Mesh] OR "Ascaris"[Mesh] OR "Astroviridae"[Mesh] OR "Cyclospora"[Mesh] OR "Hymenolepis nana"[Mesh] OR "Ancylostomatoidea"[Mesh] OR "Isospora"[Mesh] OR "Norovirus"[Mesh] OR "Plesiomonas"[Mesh] OR "Rotavirus"[Mesh] OR "Salmonella"[Mesh] OR "Sapovirus"[Mesh] OR "Shigella"[Mesh] OR "Strongyloides"[Mesh] OR "Trichuris"[Mesh] OR "Vibrio cholerae"[Mesh] OR "Yersinia"[Mesh] OR "enteric pathogen\*"[tiab] OR enteropathogen\*[tiab] OR "entero pathogen\*"[tiab] OR "entero-pathogen\*"[tiab] OR enterobacteria\*[tiab] OR "entero bacteria\*"[tiab] OR "entero-bacteria\*"[tiab] OR "enteric bacteria"[tiab] OR "enteric protozoa\*"[tiab] OR "enteric virus"[tiab] OR enterovir\*[tiab] OR "entero vir\*"[tiab] OR "entero-vir\*"[tiab] OR (diarrheagenic[tiab] OR "diarrhea-genic"[tiab] OR "diarrhea genic"[tiab] OR enteroaggregative[tiab] OR "entero aggregative"[tiab] OR "entero-aggregative"[tiab] OR enterohemorrhagic[tiab] OR "entero hemorrhagic"[tiab] OR "entero-hemorrhagic"[tiab] OR enteroinvasive[tiab] OR "entero invasive"[tiab] OR "entero-invasive"[tiab] OR enteropathogenic[tiab] OR "entero pathogenic"[tiab] OR "entero-pathogenic"[tiab] OR enterotoxigenic[tiab] OR "entero toxigenic"[tiab] OR "entero-toxigenic"[tiab]) AND ("E. coli"[tiab] OR "Escherichia coli"[tiab] OR "EAEC"[tiab] OR "Enteroaggregative Escherichia coli"[tiab] OR "EPEC"[tiab] OR"ETEC"[tiab] OR "EHEC"[tiab] OR "EIEC"[tiab] OR "Enteroinvasive Escherichia coli"[tiab] OR campylobacter\*[tiab] OR cryptosporidi\*[tiab] OR giardia\*[tiab] OR adenovirus[tiab] OR aeromonas[tiab] OR ascaris[tiab] OR astrovir\*[tiab] OR cyclospor\*[tiab] OR hymenolepi\*[tiab] OR histolytica[tiab] OR hookworm\*[tiab] OR ancylostoma\*[tiab] OR necator\*[tiab] OR isospora[tiab] OR norovirus[tiab] OR plesiomonas[tiab] OR rotavirus[tiab] OR salmonell\*[tiab] OR sapovirus[tiab] OR shiga\*[tiab] OR "STEC"[tiab] OR shigell\*[tiab] OR strongyloides[tiab] OR trichuri\*[tiab] OR "vibrio cholerae"[tiab] OR yersini\*[tiab]) **AND** ("Infant"[Mesh] OR "Child, Preschool"[Mesh] OR infant\*[tiab] OR children[tiab]) **AND** (“Growth Disorders/epidemiology”[Mesh] OR stunt\*[tiab] OR "linear growth"[tiab] OR wast\*[tiab] OR underweight[tiab])Filters: English, from 2000 – 2021

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

### Search strategy for question 2

**Search strategy: (livestock OR feces) AND (enteric pathogens) AND (smallholder)**

(“Livestock"[Mesh] OR "Poultry"[Mesh] OR "Sheep, Domestic"[Mesh] OR "Buffaloes"[Mesh] OR "Reindeer"[Mesh] OR "Goats"[Mesh] OR "Columbiformes"[Mesh] OR "Anseriformes"[Mesh] OR "Galliformes"[Mesh] OR "Chickens"[Mesh] OR "Turkeys"[Mesh] OR "Camelidae"[Mesh] OR "Rabbits"[Mesh] OR "Horses"[Mesh] OR "Guinea Pigs"[Mesh] OR (("Animals, Suckling"[Mesh] OR "Animals, Newborn"[Mesh]) AND ("Animals, Domestic"[Mesh])) OR ( "Disease Reservoirs/epidemiology"[Mesh] OR "Disease Reservoirs/microbiology"[Mesh] OR "Disease Reservoirs/parasitology"[Mesh] OR "Disease Reservoirs/prevention and control"[Mesh] OR "Disease Reservoirs/virology"[Mesh] OR "animal reservoir\*"[tiab] OR "farm animal\*"[tiab] OR "domestic animal\*"[tiab] OR "domesticated animal\*"[tiab] OR livestock[tiab] OR horse\*[tiab] OR donkey\*[tiab] OR cattle[tiab] OR cow[tiab] OR cows[tiab] OR ox[tiab] OR oxen[tiab] OR zebu\*[tiab] OR bali\*[tiab] OR yak[tiab] OR yaks[tiab] OR "water buffalo\*"[tiab] OR gayal\*[tiab] OR sheep\*[tiab] OR goat\*[tiab] OR reindeer\*[tiab] OR pig[tiab] OR pigs[tiab] OR hog[tiab] OR hogs[tiab] OR swine[tiab] OR chicken\*[tiab] OR duck\*[tiab] OR poultr\*[tiab] OR geese[tiab] OR goose[tiab] OR buffalo\*[tiab] OR "domestic fowl\*"[tiab] OR fowl\*[tiab] OR camel\*[tiab] OR llama\*[tiab] OR alpaca\*[tiab] OR rabbit\*[tiab] OR "guinea pig\*"[tiab] OR turkey\*[tiab] OR pigeon\*[tiab] OR porcine[tiab] OR bovine\*[tiab] OR mule\*[tiab] OR foal\*[tiab] OR calf[tiab] OR calves[tiab] OR gosling\*[tiab] OR duckling\*[tiab] OR piglet\*[tiab]) OR ("Feces/epidemiology"[Mesh] OR "Feces/microbiology"[Mesh] OR "Feces/parasitology"[Mesh] OR "Feces/prevention and control"[Mesh] OR "Feces/virology"[Mesh]) OR ("Manure/microbiology"[Mesh] OR "Manure/parasitology"[Mesh] OR "Manure/virology"[Mesh] OR feces[tiab] OR faeces[tiab] OR fecal[tiab] OR faecal[tiab] OR "animal waste"[tiab] OR manure[tiab] OR dung[tiab] OR dropping\*[tiab]) **AND** (("enteric pathogen\*"[tiab] OR enteropathogen\*[tiab] OR "entero pathogen\*"[tiab] OR "entero-pathogen\*"[tiab] OR enterobacteria\*[tiab] OR "entero bacteria\*"[tiab] OR "entero-bacteria\*"[tiab] OR "enteric bacteria"[tiab] OR "enteric protozoa\*"[tiab] OR "enteric virus"[tiab] OR enterovir\*[tiab] OR "entero vir\*"[tiab] OR "entero-vir\*"[tiab] OR ((diarrheagenic[tiab] OR "diarrhea-genic"[tiab] OR "diarrhea genic"[tiab] OR enteroaggregative[tiab] OR "entero aggregative"[tiab] OR "entero-aggregative"[tiab] OR enterohemorrhagic[tiab] OR "entero hemorrhagic"[tiab] OR "entero-hemorrhagic"[tiab] OR enteroinvasive[tiab] OR "entero invasive"[tiab] OR "entero-invasive"[tiab] OR enteropathogenic[tiab] OR "entero pathogenic"[tiab] OR "entero-pathogenic"[tiab] OR enterotoxigenic[tiab] OR "entero toxigenic"[tiab] OR "entero-toxigenic"[tiab]) **AND** ("Gastrointestinal Diseases/epidemiology"[Mesh] OR "Gastrointestinal Diseases/etiology"[Mesh] OR "Gastrointestinal Diseases/microbiology"[Mesh] OR "Gastrointestinal Diseases/parasitology"[Mesh] OR "Gastrointestinal Diseases/prevention and control"[Mesh] OR "Gastrointestinal Diseases/transmission"[Mesh] OR "Gastrointestinal Diseases/virology"[Mesh] OR "Escherichia coli Infections/epidemiology"[Mesh] OR "Escherichia coli Infections/microbiology"[Mesh] OR "Escherichia coli Infections/prevention and control"[Mesh] OR "Escherichia coli Infections/transmission"[Mesh] ) OR "Campylobacter"[Mesh] OR "Cryptosporidium"[Mesh] OR "Giardia"[Mesh] OR "Adenoviridae"[Mesh] OR "Aeromonas"[Mesh] OR "Ascaris"[Mesh] OR "Astroviridae"[Mesh] OR "Cyclospora"[Mesh] OR "Hymenolepis nana"[Mesh] OR "Ancylostomatoidea"[Mesh] OR "Isospora"[Mesh] OR "Norovirus"[Mesh] OR "Plesiomonas"[Mesh] OR "Rotavirus"[Mesh] OR "Salmonella"[Mesh] OR "Sapovirus"[Mesh] OR "Shigella"[Mesh] OR "Strongyloides"[Mesh] OR "Trichuris"[Mesh] OR "Vibrio cholerae"[Mesh] OR "Yersinia"[Mesh] OR "E. coli"[tiab] OR "Escherichia coli"[tiab] OR "EAEC"[tiab] OR "Enteroaggregative Escherichia coli"[tiab] OR "EPEC"[tiab] OR"ETEC"[tiab] OR "EHEC"[tiab] OR "EIEC"[tiab] OR "Enteroinvasive Escherichia coli"[tiab] OR campylobacter\*[tiab] OR cryptosporidi\*[tiab] OR giardia\*[tiab] OR adenovirus[tiab] OR aeromonas[tiab] OR ascaris[tiab] OR astrovir\*[tiab] OR cyclospor\*[tiab] OR hymenolepi\*[tiab] OR histolytica[tiab] OR hookworm\*[tiab] OR ancylostoma\*[tiab] OR necator\*[tiab] OR isospora[tiab] OR norovirus[tiab] OR plesiomonas[tiab] OR rotavirus[tiab] OR salmonell\*[tiab] OR sapovirus[tiab] OR shiga\*[tiab] OR "STEC"[tiab] OR shigell\*[tiab] OR strongyloides[tiab] OR trichuri\*[tiab] OR "vibrio cholerae"[tiab] OR yersini\*[tiab]) **AND** (Animal Husbandry"[Mesh] OR "Rural Population"[Mesh] OR smallhold\*[tiab] OR "small hold\*"[tiab] OR "small-hold\*"[tiab] OR "small-scale farm\*"[tiab] OR "smallscale farm\*"[tiab] OR "small scale farm\*"[tiab] OR "small-scale agriculture\*"[tiab] OR "smallscale agriculture\*"[tiab] OR "small scale agriculture\*"[tiab] OR subsistence[tiab] OR "subsistence farm\*"[tiab] OR "subsistence farming"[tiab] OR "family farm"[tiab] OR "pastoral"[tiab] OR "herding"[tiab] OR "agro-pastoral"[tiab] OR "agropastoral"[tiab] OR "agro pastoral"[tiab]) AND (2000:2021[pdat]) AND (english[Filter])

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

### Search strategy for question 3

#### Source attribution technologies: (Source attribution) AND (enteric pathogens) AND (Animal/food/drinking water)

("source-track\*"[tiab] OR "source track\*"[tiab] OR "source attribut\*"[tiab] OR "source-attribut\*"[tiab]) **AND** ("Gastrointestinal Diseases/epidemiology"[Mesh] OR "Gastrointestinal Diseases/etiology"[Mesh] OR "Gastrointestinal Diseases/microbiology"[Mesh] OR "Gastrointestinal Diseases/parasitology"[Mesh] OR "Gastrointestinal Diseases/prevention and control"[Mesh] OR "Gastrointestinal Diseases/transmission"[Mesh] OR "Gastrointestinal Diseases/virology"[Mesh] OR "Escherichia coli Infections/epidemiology"[Mesh] OR "Escherichia coli Infections/microbiology"[Mesh] OR "Escherichia coli Infections/prevention and control"[Mesh] OR "Escherichia coli Infections/transmission"[Mesh] OR "Campylobacter"[Mesh] OR "Cryptosporidium"[Mesh] OR "Giardia"[Mesh] OR "Adenoviridae"[Mesh] OR "Aeromonas"[Mesh] OR "Ascaris"[Mesh] OR "Astroviridae"[Mesh] OR "Cyclospora"[Mesh] OR "Hymenolepis nana"[Mesh] OR "Ancylostomatoidea"[Mesh] OR "Isospora"[Mesh] OR "Norovirus"[Mesh] OR "Plesiomonas"[Mesh] OR "Rotavirus"[Mesh] OR "Salmonella"[Mesh] OR "Sapovirus"[Mesh] OR "Shigella"[Mesh] OR "Strongyloides"[Mesh] OR "Trichuris"[Mesh] OR "Vibrio cholerae"[Mesh] OR "Yersinia"[Mesh] OR "E. coli"[tiab] OR "Escherichia coli"[tiab] OR "EAEC"[tiab] OR "Enteroaggregative Escherichia coli"[tiab] OR "EPEC"[tiab] OR"ETEC"[tiab] OR "EHEC"[tiab] OR "EIEC"[tiab] OR “Enteroinvasive Escherichia coli”[tiab] OR campylobacter\*[tiab] OR cryptosporidi\*[tiab] OR giardia\*[tiab] OR adenovirus[tiab] OR aeromonas[tiab] OR ascaris[tiab] OR astrovir\*[tiab] OR cyclospor\*[tiab] OR hymenolepi\*[tiab] OR histolytica[tiab] OR hookworm\*[tiab] OR ancylostoma\*[tiab] OR necator\*[tiab] OR isospora[tiab] OR norovirus[tiab] OR plesiomonas[tiab] OR rotavirus[tiab] OR salmonell\*[tiab] OR sapovirus[tiab] OR shiga\*[tiab] OR "STEC"[tiab] OR shigell\*[tiab] OR strongyloides[tiab] OR trichuri\*[tiab] OR "vibrio cholerae"[tiab] OR yersini\*[tiab] OR "enteric pathogen\*"[tiab] OR enteropathogen\*[tiab] OR “entero pathogen\*”[tiab] OR “entero-pathogen\*”[tiab] OR enterobacteria\*[tiab] OR “entero bacteria\*”[tiab] OR “entero-bacteria\*”[tiab] OR "enteric bacteria"[tiab] OR "enteric protozoa\*"[tiab] OR "enteric virus"[tiab] OR enterovir\*[tiab] OR “entero vir\*”[tiab] OR “entero-vir\*”[tiab] OR diarrheagenic[tiab] OR “diarrhea-genic”[tiab] OR “diarrhea genic”[tiab] OR enteroaggregative[tiab] OR “entero aggregative”[tiab] OR “entero-aggregative”[tiab] OR enterohemorrhagic[tiab] OR “entero hemorrhagic”[tiab] OR “entero-hemorrhagic”[tiab] OR enteroinvasive[tiab] OR “entero invasive”[tiab] OR “entero-invasive”[tiab] OR enteropathogenic[tiab] OR “entero pathogenic”[tiab] OR “entero-pathogenic”[tiab] OR enterotoxigenic[tiab] OR “entero toxigenic”[tiab] OR “entero-toxigenic”[tiab]) **AND** ("Livestock"[Mesh] OR "Poultry"[Mesh] OR "Sheep, Domestic"[Mesh] OR "Buffaloes"[Mesh] OR "Reindeer"[Mesh] OR "Goats"[Mesh] OR "Columbiformes"[Mesh] OR "Anseriformes"[Mesh] OR "Galliformes"[Mesh] OR "Chickens"[Mesh] OR "Turkeys"[Mesh] OR "Camelidae"[Mesh] OR "Rabbits"[Mesh] OR "Horses"[Mesh] OR "Guinea Pigs"[Mesh] OR "Animals, Suckling"[Mesh] OR "Animals, Newborn"[Mesh] OR "Animals, Domestic"[Mesh] OR "farm animal\*"[tiab] OR "domestic animal\*"[tiab] OR “domesticated animal\*”[tiab] OR livestock[tiab] OR horse\*[tiab] OR donkey\*[tiab] OR cattle[tiab] OR cow[tiab] OR cows[tiab] OR ox[tiab] OR oxen[tiab] OR zebu\*[tiab] OR bali\*[tiab] OR yak[tiab] OR yaks[tiab] OR "water buffalo\*"[tiab] OR gayal\*[tiab] OR sheep\*[tiab] OR goat\*[tiab] OR reindeer\*[tiab] OR pig[tiab] OR pigs[tiab] OR hog[tiab] OR hogs[tiab] OR swine[tiab] OR chicken\*[tiab] OR duck\*[tiab] OR poultr\*[tiab] OR geese[tiab] OR goose[tiab] OR buffalo\*[tiab] OR “domestic fowl\*”[tiab] OR fowl\*[tiab] OR camel\*[tiab] OR llama\*[tiab] OR alpaca\*[tiab] OR rabbit\*[tiab] OR "guinea pig\*"[tiab] OR turkey\*[tiab] OR pigeon\*[tiab] OR porcine[tiab] OR bovine\*[tiab] OR mule\*[tiab] OR foal\*[tiab] OR calf[tiab] OR calves[tiab] OR gosling\*[tiab] OR duckling\*[tiab] OR piglet\*[tiab]) **AND** ("Disease Reservoirs/epidemiology"[Mesh] OR "Disease Reservoirs/microbiology"[Mesh] OR "Disease Reservoirs/parasitology"[Mesh] OR "Disease Reservoirs/prevention and control"[Mesh] OR "Disease Reservoirs/virology"[Mesh] OR "Food/epidemiology"[Mesh] OR "Food/microbiology"[Mesh] OR "Food/parasitology"[Mesh] OR "Food/virology"[Mesh] OR "Drinking Water/microbiology"[Mesh] OR "Drinking Water/parasitology"[Mesh] OR "Drinking Water/virology"[Mesh] OR "animal reservoir\*"[tiab]) AND (2000:2021[pdat]) AND (english[Filter])

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

#### Control methods

##### Animal waste management

((waste\*[tiab] OR manure[tiab] OR dung[tiab] OR feces[tiab] OR faeces[tiab] OR fecal[tiab] OR faecal[tiab]) **AND** ("Livestock"[Mesh] OR "Poultry"[Mesh] OR animal[tiab] OR livestock[tiab] OR poultr\*[tiab] OR cow [tiab] OR cows [tiab] OR pig [tiab] OR pigs [tiab] OR swine\* [tiab] OR hog [tiab] OR hogs [tiab] OR goat\* [tiab] OR sheep\* [tiab] OR lamb\* [tiab] OR chicken\* [tiab] OR goose [tiab] OR geese [tiab] OR duck [tiab] OR ducks [tiab] OR ducking\* [tiab] OR piglet\* [tiab] OR calf [tiab] OR calves [tiab] OR buffalo\* [tiab])) **AND** (("Waste management"[MeSH] OR manag\*[tiab] OR treat\*[tiab] OR compost\*[tiab] OR "bio-digester\*"[tiab] OR "bio digester\*"[tiab] OR biodigester\*[tiab] OR "vegetative buffer\*"[tiab] OR "riparian buffer\*"[tiab] OR "anaerobic digest\*"[tiab] OR "vegetative filter strip\*"[tiab] OR "vegetated filter strip\*"[tiab]) **OR** (reduc\*[tiab] OR inactiv\*[tiab])**) AND** ("low-income countr\*" OR "low income countr\*" OR "middle-income countr\*" OR "middle income countr\*" OR "low- and middle-income countr\*" OR "Afghanistan"[Mesh] OR "Benin"[Mesh] OR "Burkina Faso"[Mesh] OR "Burundi"[Mesh] OR "Cambodia"[Mesh] OR "Central African Republic"[Mesh] OR "Chad"[Mesh] OR "Comoros"[Mesh] OR "Democratic People's Republic of Korea"[Mesh] OR "Democratic Republic of the Congo"[Mesh] OR "Ethiopia"[Mesh] OR "Eritrea"[Mesh] OR "Gambia"[Mesh] OR "Guinea"[Mesh] OR "Guinea-Bissau"[Mesh] OR "Haiti"[Mesh] OR "Liberia"[Mesh] OR "Madagascar"[Mesh] OR "Malawi"[Mesh] OR "Mali"[Mesh] OR "Mozambique"[Mesh] OR "Nepal"[Mesh] OR "Niger"[Mesh] OR "Rwanda"[Mesh] OR "Sierra Leone"[Mesh] OR "Somalia"[Mesh] OR "South Sudan"[Mesh] OR "Tanzania"[Mesh] OR "Togo"[Mesh] OR "Uganda"[Mesh] OR "Zimbabwe"[Mesh] "Armenia"[Mesh] OR "Bangladesh"[Mesh] OR "Bhutan"[Mesh] OR "Bolivia"[Mesh] OR "Cameroon"[Mesh] OR "Cabo Verde"[Mesh] OR "Congo"[Mesh] OR "Cote d'Ivoire"[Mesh] OR "Djibouti"[Mesh] OR "Egypt"[Mesh] OR "El Salvador"[Mesh] OR "Georgia (Republic)"[Mesh] OR "Ghana"[Mesh] OR "Guatemala"[Mesh] OR "Guyana"[Mesh] OR "Honduras"[Mesh] OR "India"[Mesh] OR "Indonesia"[Mesh] OR "Kenya"[Mesh] OR "Kosovo"[Mesh] OR "Kyrgyzstan"[Mesh] OR "Laos"[Mesh] OR "Lesotho"[Mesh] OR "Mauritania"[Mesh] OR "Micronesia"[Mesh] OR "Moldova"[Mesh] OR "Morocco"[Mesh] OR "Myanmar"[Mesh] OR "Nicaragua"[Mesh] OR "Nigeria"[Mesh] OR "Pakistan"[Mesh] OR "Papua New Guinea"[Mesh] OR "Philippines"[Mesh] OR "Independent State of Samoa"[Mesh] OR "Senegal"[Mesh] OR "Sri Lanka"[Mesh] OR "Eswatini"[Mesh] OR "Syria"[Mesh] OR "Tajikistan"[Mesh] OR "Timor-Leste"[Mesh] OR "Ukraine"[Mesh] OR "Uzbekistan"[Mesh] OR "Vanuatu"[Mesh] OR "Vietnam"[Mesh] OR "Yemen"[Mesh] OR "Zambia"[Mesh]) AND ((english[Filter]) AND (2000:2021[pdat]))

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Animal movement containment

(("Livestock"[Mesh] OR "Poultry"[Mesh] OR cow [tiab] OR cows [tiab] OR pig [tiab] OR pigs [tiab] OR swine\* [tiab] OR hog [tiab] OR hogs [tiab] OR goat\* [tiab] OR sheep\* [tiab] OR lamb\* [tiab] OR chicken\* [tiab] OR goose [tiab] OR geese [tiab] OR duck [tiab] OR ducks [tiab] OR ducking\* [tiab] OR piglet\* [tiab] OR calf [tiab] OR calves [tiab] OR buffalo\* [tiab]) **AND** ("Feces/adverse effects"[Mesh] OR "Feces/microbiology"[Mesh] OR "Feces/parasitology"[Mesh] OR "animal waste"[tiab] OR feces [tiab] OR faeces [tiab] OR faecal [tiab] OR fecal [tiab] OR dropping\* [tiab] OR dung\*[tiab] OR "enteric pathogen\*"[tiab])) OR ("child growth" OR stunting OR EED OR diarrhea OR diarrhoea) **AND** (corral\*[tiab] OR pen[tiab] OR pens[tiab] OR "animal movement"[tiab]) **AND** (("small scale"[tiab] OR "small-scale"[tiab] OR family[tiab]) **AND** (farm\*[tiab] OR agriculture[tiab] OR husbandry[tiab])) AND ((english[Filter]) AND (2000:2021[pdat]))

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Milking hygiene/milk treatment

(("Hygiene"[Mesh] OR "Sanitation"[Mesh] OR milking[tiab]) **AND** (hygiene[tiab] OR sanita\*[tiab])) OR (("Milk"[Mesh] OR milk[tiab] OR dairy[tiab] OR "dairy product\*"[tiab] OR "milk product\*"[tiab] OR yogurt\*[tiab] OR yoghurt[tiab] OR "Yogurt"[Mesh]) **AND** (pasteuris\*[tiab] OR pasteuriz\*[tiab] OR boil\*[tiab])) **AND** ("small scale"[tiab] OR "small-scale"[tiab] OR smallhold\*[tiab] OR "small hold\*"[tiab] OR household\*[tiab]) AND (english[Filter]) AND (2000:2021[pdat])

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Slaughtering hygiene

(contaminat\*[tiab] OR decontaminat\*[tiab] OR hygiene[tiab] OR hygienic[tiab]) **AND** (carcass\*[tiab] OR slaughter\*[tiab] OR butcher\*[tiab]) **AND** ("small scale"[tiab] OR "small-scale"[tiab] OR smallhold\*[tiab] OR "small hold\*"[tiab]) AND ((english[Filter]) AND (2000:2021[pdat]))

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Food preparation and fomites

("Disinfection"[Mesh] OR "Detergents"[Mesh] OR disinfect\*[tiab] OR "Detergents"[Mesh] OR detergent\*[tiab] OR wash\*[tiab] OR clean\*[tiab] OR soap\*[tiab]) **AND** ("Cooking and Eating Utensils"[Mesh] OR kitchen[tiab] OR "food preparation"[tiab] OR "eating utensils"[tiab] OR surfac\*[tiab] OR dish\*[tiab] OR bowl\*[tiab] OR plate\*[tiab] OR "cutting board"[tiab] OR "butcher block"[tiab] OR cutter\*[tiab] OR blade\*[tiab] OR mincer\*[tiab] OR bottle\*[tiab] OR floors[tiab] OR "Play and Playthings"[Mesh] OR toy[tiab] OR toys[tiab] OR "household fomite\*"[tiab]) **AND** (("Enteritis/prevention and control"[Mesh] OR "Food Contamination/prevention and control"[Mesh] OR "Diarrhea/prevention and control"[Mesh] OR "enteric pathogen\*"[tiab] OR "food contaminat\*"[tiab] OR diarrhea[tiab] OR diarrhoea[tiab] OR enteritis[tiab]) **AND** (prevent\*[tiab] OR control\*[tiab] OR manag\*[tiab] OR interven\*[tiab])) **AND** ("low-income countr\*" OR "middle-income countr\*" OR "low- and middle-income countr\*" OR "low income countr\*" OR "middle income countr\*" OR Afghanistan OR Afghan\* OR Benin\* OR "Burkina Faso" OR Burundi\* OR Cambodia\* OR "Central African Republic" OR Chad OR Comoros OR "Democratic Republic of the Congo" OR Eritrea\* OR Ethiopia\* OR Gambia\* OR Guinea\* OR Haiti\* OR "North Korea" OR "North Korean" OR Liberia\* OR Madagascar OR malagas\* OR Malawi\* OR Mali\* OR Mozambiqu\* OR Nepal\* OR Niger\* OR Rwanda\* OR "Sierra Leon\*" OR Somalia\* OR "South Sudan\*" OR Tanzania\* OR Togo\* OR Uganda\* OR Zimbabwe\* OR Armenia\* OR Bangladesh\* OR Bhutan\* OR Bolivia\* OR Cameroon\* OR "Cape Verde" OR "Republic of the Congo" OR "Cote d’Ivoire" OR Djibouti\* OR "Arab Republic of Egypt" or Egypt\* OR "El Salvador" OR Salvadoran\* OR Georgia\* OR Ghana\* OR Guatemala\* OR Guyana\* OR Honduras OR Honduran\* OR India OR Indonesia\* OR Kenya\* OR Kiribati\* OR Kosovo OR Kosovan\* OR Kyrgyz\* OR "Kyrgyz Republic" OR "Lao People’s Democratic Republic" OR Laos OR Laotian\* OR Lesotho\* OR Mauritania\* OR Micronesia\* OR Moldova\* OR Morocc\* OR Myanmar OR Burma OR Burmese OR Nicaragua\* OR Nigeria\* OR Pakistan\* OR "Papua New Guinea" OR "new guinean\*" OR Philippines OR Filpin\* OR Samoa\* OR "Sao Tome and Principe" OR Senegal\* OR "Solomon Islands" OR "Sri Lanka" OR "sri lankan" OR "sri lankans" OR Ceylon\* OR Sudan\* OR Swaziland OR Syria\* OR Tajikistan\* OR "Timor-Leste" OR Ukraine OR Ukrainian\* OR Uzbekistan\* OR Vanuatu\* OR Vietnam\* OR "Viet Nam" OR Vietnam\* OR Gaza\* OR "West Bank" OR Yemen\* OR Zambia\* OR Albania\* OR Algeria\* OR "American Samoa" OR Angola\* OR Azerbaijan\* OR Belarus\* OR Belize\* OR "Bosnia and Herzegovina" OR Bosnian\* OR Botswana\* OR Brazil\* OR Bulgaria\* OR China OR Chinese OR "Costa Rica" OR Cuba\* OR Dominica\* OR "Dominican Republic" OR Ecuador\* OR Fiji\* OR Gabon\* OR Grenada\* OR "Islamic Republic of Iran" OR Iran\* OR Iraq\* OR Jamaica\* OR Jordan\* OR Kazakhstan\* OR Lebanon OR Lebanese OR Libya\* OR Macedonia\* OR Malaysia\* OR Maldiv\* OR "Marshall Island\*" OR Mauritius OR Mauritian\* OR Mexic\* OR Mongolia\* OR Montenegro OR Montenegrin\* OR Namibia\* OR Palau\* OR Panama OR Panamanian\* OR Paraguay\* OR Peru\* OR Romania\* OR Serbia\* OR "South Africa\*" OR "St Lucia\*" OR "St. Vincent and the Grenadines" OR "St Vincent" OR "Grenadines" OR Surinam\* OR Thai\* OR Tonga\* OR Tunisia\* OR Turkmenistan\* OR Tuvalu\*) AND ((english[Filter]) AND (2000:2021[pdat]))

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Food preservation

("Food Preservation"[Mesh] OR ferment\*[tiab] OR "air-dry"[tiab] OR "air dry"[tiab] OR "air dried" [tiab] OR "air-dried"[tiab]) **AND** (milk[tiab] OR dairy[tiab] OR yogurt[tiab] OR yoghurt[tiab] OR meat\*[tiab] OR egg[tiab] OR eggs[tiab]) **AND** ("smallhold\*"[tiab] OR "small hold\*"[tiab] OR "small-hold\*"[tiab] OR "small-scale"[tiab] OR "smallscale"[tiab] OR "household\*"[tiab]) AND ((english[Filter]) AND (2000:2021[pdat]))

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Food and water storage

("Food Storage"[Mesh] OR "food storage"[tiab] OR “stored water”[tiab] OR "Cooking and Eating Utensils"[Mesh] OR "eating utensil\*"[tiab] OR "cooking utensil\*"[tiab] OR knife[tiab] OR knives[tiab] OR fork\*[tiab] OR spoon\*[tiab] OR pan[tiab] OR pans[tiab] OR pot[tiab] OR pots[tiab] OR bowl\*[tiab] OR plate\*[tiab]) **AND (**("Hygiene"[Mesh] OR hygiene[tiab] OR "Enteritis/prevention and control"[Mesh] OR "Food Contamination/prevention and control"[Mesh] OR "Diarrhea/prevention and control"[Mesh]) OR (("food contaminat\*"[tiab] OR "enteric pathogen\*"[tiab] OR diarrhea[tiab] OR diarrhoea[tiab] OR enteritis[tiab]) **AND** (prevent\*[tiab] OR control\*[tiab] OR manag\*[tiab] OR interven\*[tiab]))) **AND** ("low-income countr\*" OR "middle-income countr\*" OR "low- and middle-income countr\*" OR "low income countr\*" OR "middle income countr\*" OR Afghanistan OR Afghan\* OR Benin\* OR "Burkina Faso" OR Burundi\* OR Cambodia\* OR "Central African Republic" OR Chad OR Comoros OR "Democratic Republic of the Congo" OR Eritrea\* OR Ethiopia\* OR Gambia\* OR Guinea\* OR Haiti\* OR "North Korea" OR "North Korean" OR Liberia\* OR Madagascar OR malagas\* OR Malawi\* OR Mali\* OR Mozambiqu\* OR Nepal\* OR Niger\* OR Rwanda\* OR "Sierra Leon\*" OR Somalia\* OR "South Sudan\*" OR Tanzania\* OR Togo\* OR Uganda\* OR Zimbabwe\* OR Armenia\* OR Bangladesh\* OR Bhutan\* OR Bolivia\* OR Cameroon\* OR "Cape Verde" OR "Republic of the Congo" OR "Cote d’Ivoire" OR Djibouti\* OR "Arab Republic of Egypt" or Egypt\* OR "El Salvador" OR Salvadoran\* OR Georgia\* OR Ghana\* OR Guatemala\* OR Guyana\* OR Honduras OR Honduran\* OR India OR Indonesia\* OR Kenya\* OR Kiribati\* OR Kosovo OR Kosovan\* OR Kyrgyz\* OR "Kyrgyz Republic" OR "Lao People’s Democratic Republic" OR Laos OR Laotian\* OR Lesotho\* OR Mauritania\* OR Micronesia\* OR Moldova\* OR Morocc\* OR Myanmar OR Burma OR Burmese OR Nicaragua\* OR Nigeria\* OR Pakistan\* OR "Papua New Guinea" OR "new guinean\*" OR Philippines OR Filpin\* OR Samoa\* OR "Sao Tome and Principe" OR Senegal\* OR "Solomon Islands" OR "Sri Lanka" OR "sri lankan" OR "sri lankans" OR Ceylon\* OR Sudan\* OR Swaziland OR Syria\* OR Tajikistan\* OR "Timor-Leste" OR Ukraine OR Ukrainian\* OR Uzbekistan\* OR Vanuatu\* OR Vietnam\* OR "Viet Nam" OR Vietnam\* OR Gaza\* OR "West Bank" OR Yemen\* OR Zambia\* OR Albania\* OR Algeria\* OR "American Samoa" OR Angola\* OR Azerbaijan\* OR Belarus\* OR Belize\* OR "Bosnia and Herzegovina" OR Bosnian\* OR Botswana\* OR Brazil\* OR Bulgaria\* OR China OR Chinese OR "Costa Rica" OR Cuba\* OR Dominica\* OR "Dominican Republic" OR Ecuador\* OR Fiji\* OR Gabon\* OR Grenada\* OR "Islamic Republic of Iran" OR Iran\* OR Iraq\* OR Jamaica\* OR Jordan\* OR Kazakhstan\* OR Lebanon OR Lebanese OR Libya\* OR Macedonia\* OR Malaysia\* OR Maldiv\* OR "Marshall Island\*" OR Mauritius OR Mauritian\* OR Mexic\* OR Mongolia\* OR Montenegro OR Montenegrin\* OR Namibia\* OR Palau\* OR Panama OR Panamanian\* OR Paraguay\* OR Peru\* OR Romania\* OR Serbia\* OR "South Africa\*" OR "St Lucia\*" OR "St. Vincent and the Grenadines" OR "St Vincent" OR "Grenadines" OR Surinam\* OR Thai\* OR Tonga\* OR Tunisia\* OR Turkmenistan\* OR Tuvalu\*) AND ((english[Filter]) AND (2000:2021[pdat]))

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

##### Food and feeding hygiene

("Hand Hygiene"[Mesh] OR "hand hygiene\*"[tiab] OR hygiene [tiab] OR "hand-washing"[tiab] OR "hand washing"[tiab] OR "handwash\*"[tiab] OR boil\*[tiab] OR reheat\*[tiab]) **OR** ("Food Handling" [Mesh] OR "food prepar\*"[tiab] OR "food handl\*"[tiab] OR "Bottle Feeding"[Mesh] OR "bottle feed\*"[tiab] OR "bottle fed"[tiab] OR "baby bottle\*"[tiab] OR "feeding bottle\*"[tiab] OR "Feeding Behavior"[Mesh] OR "feeding behaviour\*"[tiab] OR "feeding behavior\*"[tiab] OR "eating behaviour\*"[tiab] OR "eating behavior\*"[tiab]) **AND** ("Enteritis/prevention and control"[Mesh] OR "Food Contamination/prevention and control"[Mesh] OR "Diarrhea/prevention and control"[Mesh]) **AND** ("low-income countr\*" OR "middle-income countr\*" OR "low- and middle-income countr\*" OR "low income countr\*" OR "middle income countr\*" OR Afghanistan OR Afghan\* OR Benin\* OR "Burkina Faso" OR Burundi\* OR Cambodia\* OR "Central African Republic" OR Chad OR Comoros OR "Democratic Republic of the Congo" OR Eritrea\* OR Ethiopia\* OR Gambia\* OR Guinea\* OR Haiti\* OR "North Korea" OR "North Korean" OR Liberia\* OR Madagascar OR malagas\* OR Malawi\* OR Mali\* OR Mozambiqu\* OR Nepal\* OR Niger\* OR Rwanda\* OR "Sierra Leon\*" OR Somalia\* OR "South Sudan\*" OR Tanzania\* OR Togo\* OR Uganda\* OR Zimbabwe\* OR Armenia\* OR Bangladesh\* OR Bhutan\* OR Bolivia\* OR Cameroon\* OR "Cape Verde" OR "Republic of the Congo" OR "Cote d’Ivoire" OR Djibouti\* OR "Arab Republic of Egypt" or Egypt\* OR "El Salvador" OR Salvadoran\* OR Georgia\* OR Ghana\* OR Guatemala\* OR Guyana\* OR Honduras OR Honduran\* OR India OR Indonesia\* OR Kenya\* OR Kiribati\* OR Kosovo OR Kosovan\* OR Kyrgyz\* OR "Kyrgyz Republic" OR "Lao People’s Democratic Republic" OR Laos OR Laotian\* OR Lesotho\* OR Mauritania\* OR Micronesia\* OR Moldova\* OR Morocc\* OR Myanmar OR Burma OR Burmese OR Nicaragua\* OR Nigeria\* OR Pakistan\* OR "Papua New Guinea" OR "new guinean\*" OR Philippines OR Filpin\* OR Samoa\* OR "Sao Tome and Principe" OR Senegal\* OR "Solomon Islands" OR "Sri Lanka" OR "sri lankan" OR "sri lankans" OR Ceylon\* OR Sudan\* OR Swaziland OR Syria\* OR Tajikistan\* OR "Timor-Leste" OR Ukraine OR Ukrainian\* OR Uzbekistan\* OR Vanuatu\* OR Vietnam\* OR "Viet Nam" OR Vietnam\* OR Gaza\* OR "West Bank" OR Yemen\* OR Zambia\* OR Albania\* OR Algeria\* OR "American Samoa" OR Angola\* OR Azerbaijan\* OR Belarus\* OR Belize\* OR "Bosnia and Herzegovina" OR Bosnian\* OR Botswana\* OR Brazil\* OR Bulgaria\* OR China OR Chinese OR "Costa Rica" OR Cuba\* OR Dominica\* OR "Dominican Republic" OR Ecuador\* OR Fiji\* OR Gabon\* OR Grenada\* OR "Islamic Republic of Iran" OR Iran\* OR Iraq\* OR Jamaica\* OR Jordan\* OR Kazakhstan\* OR Lebanon OR Lebanese OR Libya\* OR Macedonia\* OR Malaysia\* OR Maldiv\* OR "Marshall Island\*" OR Mauritius OR Mauritian\* OR Mexic\* OR Mongolia\* OR Montenegro OR Montenegrin\* OR Namibia\* OR Palau\* OR Panama OR Panamanian\* OR Paraguay\* OR Peru\* OR Romania\* OR Serbia\* OR "South Africa\*" OR "St Lucia\*" OR "St. Vincent and the Grenadines" OR "St Vincent" OR "Grenadines" OR Surinam\* OR Thai\* OR Tonga\* OR Tunisia\* OR Turkmenistan\* OR Tuvalu\*) AND ((english[Filter]) AND (2000:2021[pdat])

Additional databases searched**: Embase, Web of Science Core Collection** and **CABI (Global Health)**.

# Supplementary information 2

## Eligibility criteria for literature studying the benefits of smallholder livestock production

### Eligibility criteria for literature studying question 1

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations Studied: Infants and young children (0-5 years) living in smallholder OR pastoralist families/groups
* Geographic Areas: Low- and middle- income countries (LMIC)

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Articles for which full-text was not readily available at our institution
* Articles that do not investigate household or child diet

### Eligibility criteria for literature studying question 2

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations Studied: Infants and young children (0-5 years) living in smallholder OR pastoralist families/groups
* Geographic Areas: Low- and middle- income countries (LMIC)

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Articles for which full-text was not readily available at our institution
* Articles that do not investigate household or child diet and household income, sale, or expenditure

### Eligibility criteria for literature studying question 3

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations Studied: Infants and young children (0-5 years) living in smallholder OR pastoralist families/groups
* Geographic Areas: Low- and middle- income countries (LMIC)

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Articles for which full-text was not readily available at our institution
* Articles that do not investigate household or child diet and women’s empowerment

## Eligibility criteria for literature studying the risks of smallholder livestock production

### Eligibility criteria for literature studying question 1

#### Eligibility criteria for literature studying pathogens associated with environmental enteric dysfunction (EED)

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations Studied: Infants and young children (0-5 years) OR experimental animals
* Geographic Areas: Low- and middle- income countries (LMIC)/low-resource settings in upper middle-income countries, or laboratories conducting animal studies

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Articles that do not mention pathogens related to poor gut health, or related risk factors and pathways, or reservoirs of those pathogens
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Articles for which full-text was not readily available at our institution

#### Eligibility criteria for literature studying pathogens associated with undernutrition

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations studied: Infants and young children (0-5 years)
* Geographic areas: Low- and middle- income countries (LMIC)/low-resource settings in upper middle-income countries
* **Exclusion Criteria:**
* Articles that do not meet one or more of the above inclusion criteria
* Articles that do not mention pathogens that are statistically and significantly associated with stunting/linear growth faltering/wasting/underweight
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Articles for which full-text was not readily available at our institution

### Eligibility criteria for literature studying question 2

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations studied: Households living in smallholder OR pastoralist families/groups (including neighbors)
* Geographic areas: Low- and middle- income countries (LMIC)/low-resource settings in upper middle-income countries

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Animal: Studies focusing on "wild" animals or birds (not housed/fed regularly), fish, reptiles, amphibians or insect; studies without involvement of livestock (e.g., WaSH-related studies in settings without livestock production); livestock farming settings in western style intensive husbandry
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations; conference proceedings and meeting abstracts; book chapters
* Studies focus on only non-enteric pathogens
* Articles only study antibiotic resistance, speciation, or prevalence of pathogen in livestock
* Exclusion criteria included articles for which full-text was not readily available at our institution

### Eligibility criteria for literature studying question 3

#### Eligibility criteria for literature studying source attribution technologies

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations studied: All
* Geographic areas: Low- and middle- income countries (LMIC)/low-resource settings in upper middle-income countries

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Articles that do not mention pathogens affecting children’s gut health, fecal indicator bacteria with a specific animal origin, or related source of human exposure [i.e., livestock (no wildlife or aquatic life), food, drinking water (no marine, river/creek, ground, recreational water or natural watershed)]
* Articles do not mention source-tracking/attribution technologies
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Exclusion criteria included articles for which full-text was not readily available at our institution

#### Eligibility criteria for literature studying control methods

**Inclusion Criteria:**

* Publication Types: Any
* Languages of Full-text: English
* Publication Dates: 2000 onward
* Populations studied: All
* Geographic areas: Low- and middle- income countries (LMIC)/low-resource settings in upper middle-income countries

**Exclusion Criteria:**

* Articles that do not meet one or more of the above inclusion criteria
* Articles that do not include interventions carried out on study subjects
* Publication Types: No letters, editorials, comments unless they comment on weaknesses in studies that may/will be included in the present study; No dissertations, meeting abstracts, proceedings papers
* Exclusion criteria included articles for which full-text was not readily available at our institution

# Supplementary information 3

## Quantitative summary of search results and screening process

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Theme | Question (specification) | Items identified through database searches, personal libraries and following references | Duplicates removed through Covidence | Unique items screened\* (TIAB level) | # FT screened | # included |
| Benefits of smallholder livestock production | 1, 2, and 3\* | 3517 | 703 | 2814 | 555 | 145 |
| Risks of smallholder livestock production | 1 (EED-associated pathogens) | 1125 | 640 | 485 | 166 | 12 |
| 1 (undernutrition-associated pathogens) | 1228 | 541 | 687 | 91 | 38 |
| 2 | 4971 | 1411 | 3560 | 218 | 27 |
| 3 (attribution technologies) | 950 | 622 | 328 | 131 | 15 |
| 3 (Control methods) | 5851 | 2586 | 3265 | 66 | 29 |

\*One search strategy was used in each database (including one for the Ebsco combined-databases search) to retrieve literature on all three questions