Supplementary material S1, Questionnaire

Consent to participate:

Information to the respondent: Thank you for participating in this study conducted by the Swedish University of Agricultural Sciences, Sweden; and National Institute of Veterinary Research (NIVR), Vietnam. This questionnaire contains questions about your work experience and shop characteristics, antibiotic sales and advice routines, and finally some questions and statements regarding how antibiotics work. We would like to emphasize that participating in this study is voluntary and you can retract your consent at any time. The answers collected in this questionnaire will be anonymized and your identity will not be revealed in any published material that results from this questionnaire.

Consent to participate (Yes/No)

Section 1 – Demographics and shop characteristics

Information to the respondent: This section includes basic questions about your background and work experience as well as shop characteristics.

1. Sex of the respondent
    a) Female
    b) Male

2. Age of respondent (in years)

3. What is your main role in the shop?
    a) Owner
    b) Spouse of the owner
    c) Child of the owner
    d) Employee
    e) Other (specify)

4. For how long have you worked in a veterinary drug shop? (years or months if less than 1 year)

5. How many staff does the shop have? (number)

6. What education level do you have?
    a) Never went to school
    b) Primary school
    c) Secondary school
    d) High school
    e) Vocational training
    f) College/University
    g) Higher education (e.g. Master, PhD)

7. If answered f or g above: if you have a vocational training/college/university education, in which subject area(s)? (Free text)

8. Do you have any training or education in animal diseases and treatment?
    a) Yes
    b) No

9. If Yes to 8, how long (days or weeks) and by whom (public/private/NGOs etc.)? (Free text)

10. How do you define antibiotics? (Free text)

11. Do you have any specialized training/education in antibiotic mechanisms and antibiotic treatment recommendations?
    a) Yes
    b) No

12. If Yes to 11, how long (days or weeks) and by whom (public/private/NGOs etc.)? (Free text)

13. Do you have any education in Vietnamese regulations regarding veterinary antibiotic use and sales?
    a) Yes
    b) No

14. If Yes to 13, how long (days or weeks) and by whom (public/private/NGOs etc.)? (Free text)

15. Have you heard about antimicrobial/antibiotic resistance?
    a) Yes
    b) No

16. If Yes to 15, how do you define antimicrobial/antibiotic resistance? (Free text)

17. What livestock species are the **most commonly** owned by the farmers that come to your shop (not pets)? (up to 3 can be chosen)
    a) Chickens/hens
    b) Other poultry
    c) Pigs
    d) Cattle
    e) Small ruminants
    f) Other

18. Does your family also have some livestock?
    a) Yes
    b) No

19. If Yes to 18, what kind of livestock do you keep (not pets)? (multiple choice)
    a) Chickens/hens
    b) Other poultry
    c) Pigs
    d) Cattle
    e) Small ruminants
    f) Other

Section 2 – Antibiotic sales and advice routines

Information to the respondent: This section includes question about the routines you have when you handle, sell and give advice on antibiotics as well as questions regarding antibiotic sales.

20. When farmers come to buy antibiotics in your shop, on who's initiative do they **usually** come?
    a) Their own initiative
    b) After recommendation from a veterinarian (governmental or private)
    c) After recommendation from other

21. Have farmers that come to you to buy antibiotics had their animals examined by an animal health professional (e.g. veterinarian, animal health worker)?
    a) Always
    b) Mostly
    c) Sometimes
    d) Seldom
    e) Never
    f) I don't know

22. Do you ask for a veterinary prescription before selling antibiotics to farmers?
    a) Always
    b) Mostly
    c) Sometimes
    d) Seldom
    e) Never

23. Do the farmers that want to buy antibiotics bring a veterinary prescription?
    a) Always
    b) Mostly
    c) Sometimes
    d) Seldom
    e) Never

24. When recommending an antibiotic to a farmer that asks for advice regarding treatment of sick animals, which factors do you **mainly** consider? (up to 3 can be chosen)
    a) Preference of the farmer
    b) Price
    c) That the antibiotic should have a broad treatment spectrum
    d) That the antibiotic should have an as narrow treatment spectrum as possible
    e) Administration route (e.g. mixed in feed, injection, tablets)
    f) Treatment recommendations for the particular disease
    g) What you have most in stock
    h) The antibiotic not being critically important for human use
    i) What has the shortest expiry date
    j) Previous feedback from farmers on effectiveness
    k) Other (specify)

25. Do you give the farmer advice on how to use and handle the antibiotics?
    a) Yes, mostly
    b) Sometimes

c) No

26. If Yes or Sometimes to 25, which kind of advice? (multiple choice)
    a) Preparation of the drug (e.g. mixing it with feed or water, preparing injections)
    b) Administration procedure (i.e. how to give the antibiotic)
    c) Treatment length
    d) When to stop treatment (e.g. if adverse effects occur)
    e) Withdrawal times (i.e. the time you should wait before consuming products like eggs, milk and meat from the treated animal(s))
    f) Dosage
    g) Handling of leftover antibiotics
    h) Which animals to treat (e.g. only the sick animals, the whole flock, in contact animals)
    i) Other (specify)

27. If you give advice regarding treatment length, what do you **usually** recommend (when treating the disease for the first time)?
    a) What is stated on the package
    b) What is recommended by veterinary professionals
    c) To treat until the animal(s) begin to recover
    d) To treat until the animal(s) completely cured
    e) Other (specify)

28. If you give advice regarding treatment dosage, what do you **usually** recommend (when treating the disease for the first time)?
    a) What is stated on the package
    b) What is recommended by veterinary professionals
    c) A higher dose than what is stated on the package/recommended
    d) A lower dose than what is stated on the package/recommended
    e) Other (specify)

29. For which purposes do you recommend antibiotics to farmers? (multiple choice)
    a) To treat sick animals
    b) To prevent animals from becoming sick
    c) To make animals grow faster/better
    d) Other (specify)

30. Do you keep records of antibiotics sold at your shop?
    a) Yes
    b) No

31. From where do you **most commonly** buy the antibiotics sold in your shop?
    a) Other veterinary drug shop
    b) Drug company
    c) Drug wholesaler
    d) Other (specify)

32. What drug category is the most sold in your shop? (single choice)
    a) Antibiotics
    b) Anthelmintics
    c) Anti-inflammatory drugs
    d) Vitamins and probiotics

e) Ectoparasiticides
f) Vaccines
g) I don't know
h) Other (specify)

Information to enumerator: For Q33-36, show the options on the tablet for the respondent to make it easier to choose.

33. Which are the **most commonly** sold antibiotics in your shop? (up to 3 can be chosen)
    a) Tetracyclines (e.g. doxycycline, tetracycline)
    b) Macrolides (e.g. tylosin, erythromycin)
    c) Penicillins (e.g. amoxicillin, ampicillin)
    d) Quinolones (e.g. enrofloxacin, norfloxacin)
    e) Trimethoprim/Sulphonamides (e.g. trimethoprim-sulfadiazine, trimethoprim, sulfamethoxazole)
    f) Polypeptides (e.g. colistin)
    g) 3rd or 4th generation Cephalosporins (e.g. ceftazidime, cefotaxime, ceftiofur)
    h) 1st to 2nd generation Cephalosporins (e.g. cefazolin)
    i) Aminoglycosides (e.g. gentamycin, streptomycin)
    j) Amphenicols (e.g. florfenicol, chloramphenicol)
    k) Free text if you only know trade name or other antibiotic is more common

34. Which are the **most commonly** sold antibiotics to poultry farmers in your shop? (up to 3 can be chosen)
    a) Tetracyclines (e.g. doxycycline, tetracycline)
    b) Macrolides (e.g. tylosin, erythromycin)
    c) Penicillins (e.g. amoxicillin, ampicillin)
    d) Quinolones (e.g. enrofloxacin, norfloxacin)
    e) Trimethoprim/Sulphonamides (e.g. trimethoprim-sulfadiazine, trimethoprim, sulfamethoxazole)
    f) Polypeptides (e.g. colistin)
    g) 3rd or 4th generation Cephalosporins (e.g. ceftazidime, cefotaxime, ceftiofur)
    h) 1st to 2nd generation Cephalosporins (e.g. cefazolin)
    i) Aminoglycosides (e.g. gentamycin, streptomycin)
    j) Amphenicols (e.g. florfenicol, chloramphenicol)
    k) Free text if you only know trade name or other antibiotic is more common

35. Which antibiotic do you **most commonly** recommend to a poultry farmer with birds that show intestinal/digestive disease signs? (single choice)
    a) Tetracyclines (e.g. doxycycline, tetracycline)
    b) Macrolides (e.g. tylosin, erythromycin)
    c) Penicillins (e.g. amoxicillin, ampicillin)
    d) Quinolones (e.g. enrofloxacin, norfloxacin)
    e) Trimethoprim/Sulphonamides (e.g. trimethoprim-sulfadiazine, trimethoprim, sulfamethoxazole)
    f) Polypeptides (e.g. colistin)
    g) 3rd or 4th generation Cephalosporins (e.g. ceftazidime, cefotaxime, ceftiofur)
    h) 1st to 2nd generation Cephalosporins (e.g. cefazolin)
    i) Aminoglycosides (e.g. gentamycin, streptomycin)
    j) Amphenicols (e.g. florfenicol, chloramphenicol)
    k) Free text if you only know trade name or other antibiotic is more common

36. Which antibiotic do you **most commonly** recommend to a poultry farmer with birds that show respiratory disease signs? (single choice)
    a) Tetracyclines (e.g. doxycycline, tetracycline)
    b) Macrolides (e.g. tylosin, erythromycin)
    c) Penicillins (e.g. amoxicillin, ampicillin)
    d) Quinolones (e.g. enrofloxacin, norfloxacin)
    e) Trimethoprim/Sulphonamides (e.g. trimethoprim-sulfadiazine, trimethoprim, sulfamethoxazole)
    f) Polypeptides (e.g. colistin)
    g) 3rd or 4th generation Cephalosporins (e.g. ceftazidime, cefotaxime, ceftiofur)
    h) 1st to 2nd generation Cephalosporins (e.g. cefazolin)
    i) Aminoglycosides (e.g. gentamycin, streptomycin)
    j) Amphenicols (e.g. florfenicol, chloramphenicol)
    k) Free text if you only know trade name or other antibiotic is more common

37. Can buyers of antibiotics pick them themselves from the store shelves?
    a) Yes
    b) No, they have to ask me to get them from behind the counter

38. If Yes to 37, is there any labelling to inform the buyer that the medicine is an antibiotic?
    a) Yes
    b) No

39. If you would estimate, how many farmers that buy antibiotics from you to treat sick animals come back and say that the treatment did not work?
    a) None
    b) <25%
    c) 25-50%
    d) 50-75%
    e) >75%

40. What do you **usually** recommend when an antibiotic treatment is not effective?
    a) To continue with treatment longer
    b) To increase the dose
    c) To switch to another antibiotic
    d) To combine the treatment with another antibiotic
    e) To switch to a non-antibiotic medicine
    f) To switch to traditional medicine, e.g. herbs, medicinal plants
    g) To call a veterinarian (governmental/private) or animal health worker for advice
    h) To slaughter the sick animals
    i) Other (specify)

41. If you know about antibiotic resistance, do you inform farmers about the risk for/with resistance development?
    a) Yes, often
    b) Sometimes
    c) No

42. What do you **usually** do with expired/leftover veterinary antibiotics? (single choice)
    a) Throw in the trash/latrine

b) Send for hazard destruction
c) Sell to farmers at a cheaper price
d) Return to drug company/wholesaler
e) I have never experienced expired drugs
f) Other (specify)

Section 3 – Knowledge about antibiotics and AMR

Information to the respondent: This is the final section of the questionnaire. You will be asked some questions and true or false statements about antibiotic mechanisms and antibiotic resistance. Do not hesitate to ask for repetition of the question if you do not fully understand the first time.

43. What are antibiotics **supposed** to be used for? (single choice)
    a) Prevent animals from becoming sick
    b) Treat sick animals
    c) Make animals grow faster/better
    d) Prevent animals from becoming sick and make animals grow faster/better
    e) Prevent animals from becoming sick and treat sick animals
    f) Treat sick animals and make animals grow faster/better
    g) Prevent animals from becoming sick, treat sick animals and to make animals grow faster/better

Information to the enumerator: Present only the options True or False to the respondent. Only pick the answer "Unsure" if the respondent really cannot choose between True or False. The respondent is not allowed to go back and change already given answers. If the respondent does not understand the statement the first time, please repeat it.

44. Do you think that the following statements are true or false?
    a) Antibiotics can treat all kinds of diseases (True/False/Unsure)

    b) Antibiotics can treat diseases caused by viruses (True/False/Unsure)

    c) Antibiotics can treat diseases caused by bacteria (True/False/Unsure)

    d) Antibiotics are the same as anti-inflammatory drugs (True/False/Unsure)

    e) Animals can become resistant to antibiotics if antibiotics are used in the wrong way/too often (True/False/Unsure)

    f) Bacteria can become resistant to antibiotics if used in the wrong way/too often (True/False/Unsure)

    g) Viruses can become resistant to antibiotics if used in the wrong way/too often (True/False/Unsure)

    h) Resistance against antibiotics can make it more difficult to succeed with antibiotic treatment in animals when they get sick (True/False/Unsure)

i) Bacteria resistant to antibiotics can spread from one animal to another (True/False/Unsure)

j) Bacteria resistant to antibiotics can spread between animals and humans (True/False/Unsure)

k) Bacteria resistant to antibiotics can spread from animals to humans through animal source foods, e.g. meat (True/False/Unsure)

l) Leftovers of the antibiotic can be transferred to meat, milk or eggs (True/False/Unsure)

m) Bacteria resistant to antibiotics can spread through manure from animals (True/False/Unsure)

n) Antibiotic resistance in human bacteria is only linked to the use of antibiotics in humans and not in animals (True/False/Unsure)

Final words to the respondent: Thank you for taking the time to answer the questions in this questionnaire and for letting us visit your shop. Your participation is truly appreciated. Kind regards from the research team.

Section 4 – Information about enumerator and location

45. Questionnaire ID
46. Date of interview

47. District
    a) Dong Hy
    b) Thai Nguyen City
    c) Vo Nhai

48. If the shop is in Dong Hy, which commune?
    a) – h)

49. If the shop is in Thai Nguyen City, which commune?
    a) – s)

50. If the shop is in Vo Nhai, which commune?
    a) – h)

51. Village (free text)
52. Latitude
53. Longitude