

Prevalence of food-borne pathogens in broiler chicken and farm environment in Tamil Nadu, India

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Abstract

Poultry meat and products have an essential part to play throughout the world in supplying nutritionally adequate and safe food to human beings. The poultry meat supply chain is often associated with the most common zoonotic food-borne disease outbreaks. This study aimed to perceive the distribution and prevalence of food-borne pathogens related to improper hygienic conditions in broiler farms. The biological samples in chicken and farm environmental boot swabs were collected from five major targeted districts of broiler production in Tamil Nadu, India. Ten farms from each district were selected, and five birds in every farm were subjected to sampling. The sampling in each farm comprised five caecal, one cloacal swab from birds, and one environmental boot swab to explore food-borne pathogens by cultural and molecular methods. Altogether 50 cloacal swabs, 250 caecal swabs from chickens, and 50 environmental boot swabs from broiler production areas were collected and subjected to the isolation of *E. coli*, *Campylobacter* and NTS, respectively. The overall prevalence of *E. coli* and *Campylobacter* in chicken samples was 94% (47/50), 23.2% (58/250), and 46% (23/50) of NTS was observed in the environmental boot swabs. The results of the study indicate that the poultry management practices should be improved by policy engagement and mitigation strategies.

Introduction

- In India, poultry is one of the fastest growing segments of the agricultural sector with 2 sub-sectors.
- One with a highly organized commercial sector with about 80% of the total market share and the other being unorganized with about 20% of the total market share.
- The organized sector also referred to as commercial broiler and layer production plays a significant role for human nutrition, national income and employment.
- With its tremendous growth, India gained the world rank of 3rd and 8th in commercial egg and poultry meat production, respectively.
- Many people rely on poultry products as a source of proteins, essential amino acids, mineral salts, and vitamins.
- On the other hand, growth of human population has led to impact on the demand for animal foods production, and this disparity has led to arise severe food borne pathogens like *E. coli*, Non-Typhoidal salmonella, and *Campylobacter* species.
- The present investigation was to exploring the source of food-borne infection from commercial broiler farm and environment.

Objectives

- Selection of field studies to map the poultry production and PDNs
- To find out 10 broiler farm integrators from each 5 districts of Tamil Nadu
- To study about commercial broiler farm through sampling questionnaire
- To collect random sampling of broiler birds from farm and environment
- To isolate and identify the food-borne pathogens from the collected samples

Methods

Sampling locations

Namakkal, Coimbatore, Trichy, Tirunelveli and Chennai

Campylobacter Isolation (Jacob et al., 2021 & Wang et al., 2002)

- Modified Charcoal Cefoperazone Deoxycholate Agar

E. coli Isolation (As per SOP, UKRI-GCRF)

- MacConkey Agar

Non-typhoidal Salmonella Isolation (As per SOP, UKRI-GCRF)

- XLD Agar

Results

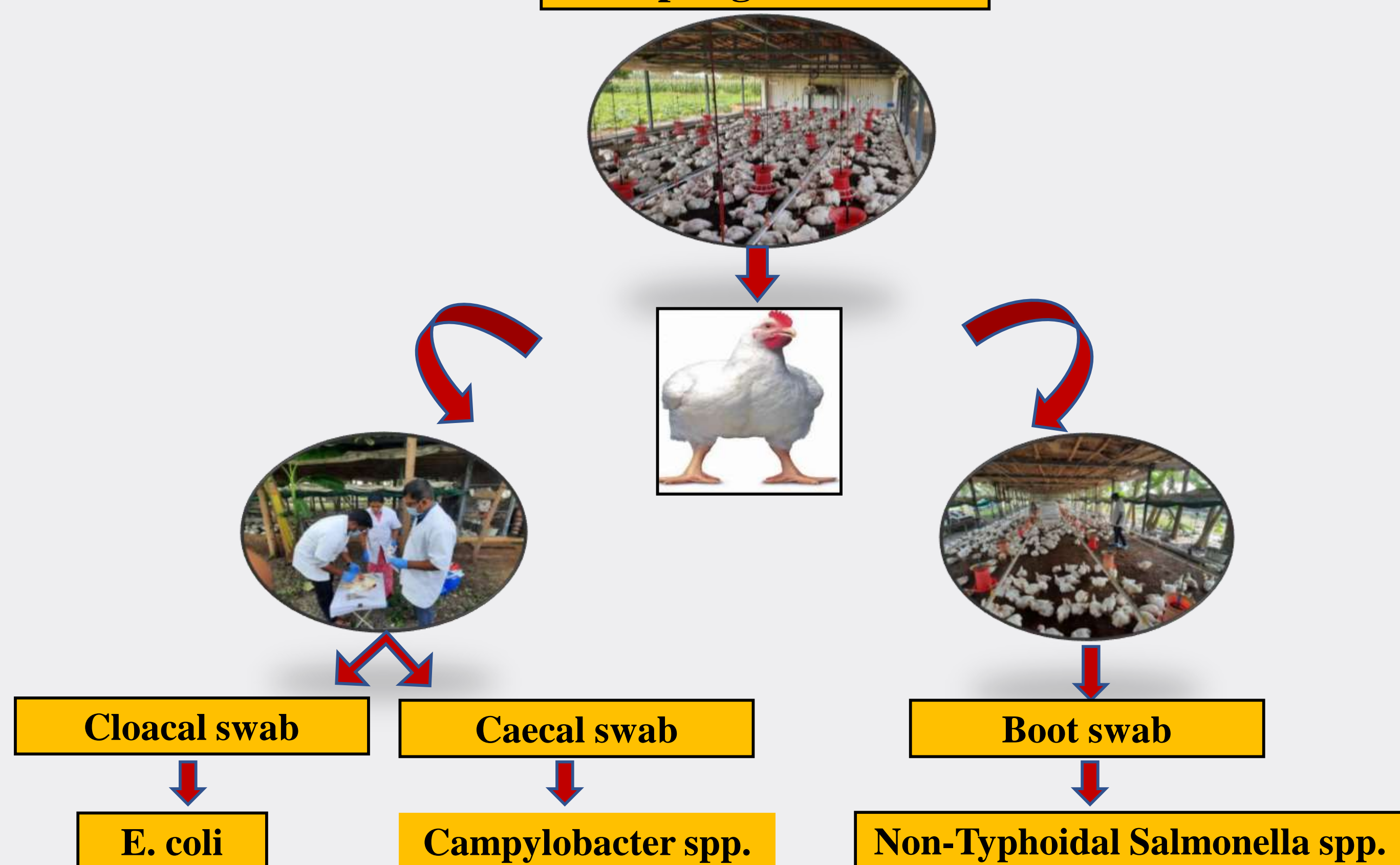
Farm survey report:

- Commercial broiler farm maintained by 94% of male and 6% of females
- Farm capacity range was 2200 to 18500 birds
- Average bird weight was 2.2 to 2.6 Kg
- 4 to 6 batches raised per year
- The average market age was 36-38 days
- Major disease outbreak was CRD, Heat stroke, Coccidiosis, Enteritis and IBV

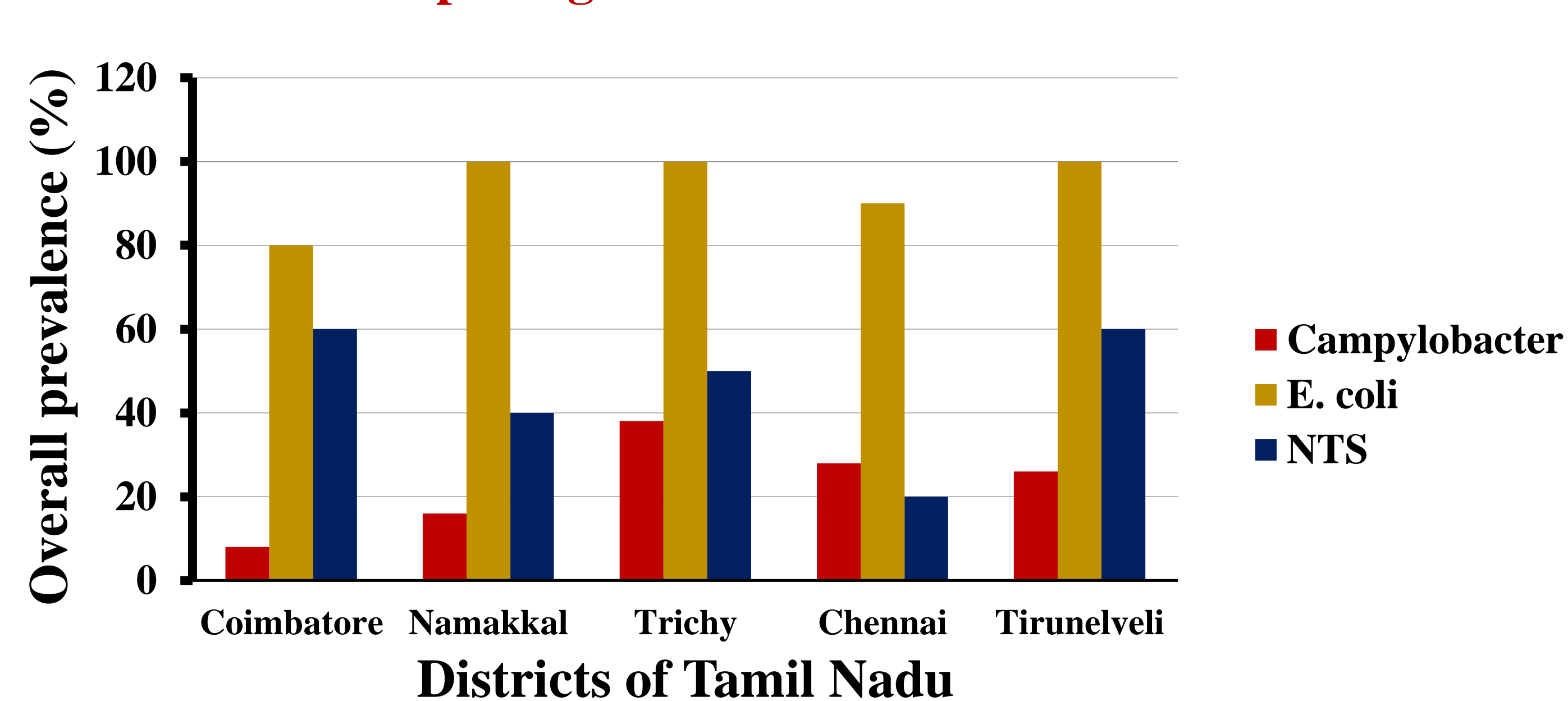
Prevalence of FBDs:

- The overall prevalence of *E. coli* and *Campylobacter* in chicken samples was 94% (47/50), 23.2% (58/250), and 46% (23/50) of NTS was observed in the environmental boot swabs.

Sampling Overview



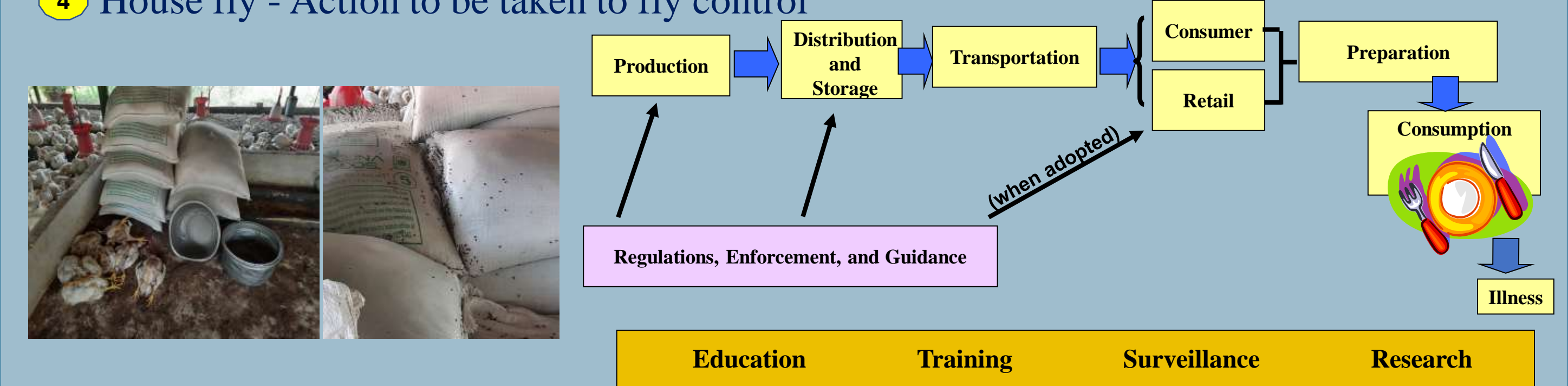
Food-borne pathogens in Commercial broiler farm



Discussion

Commercial broiler flocks infested by FBDs in asymptomatic conditions by cross contamination which could be

- 1 Biosafety measures are not properly followed
- 2 Dead birds are kept inside of the farm
- 3 Poor feed stock maintenance
- 4 House fly - Action to be taken to fly control



The results of the study indicated that the poultry management practices should be improved by policy engagement and mitigation strategies.



This is an example. Use a free web tool such as qrcode monkey to generate a QR

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