

Hygiene and sanitary conditions in an organic layer farm from Piraquara-PR, Brazil

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INTRODUCTION & AIM

Many health and food safety concerns surround egg production, especially in respect to microorganism contamination of the final product; thus, the management of hygiene and sanitary maintenance of laying hens in production is essential [1–2]. The present work aimed to accomplish hygiene indicator microorganism counts and investigate the presence of *Salmonella* sp. in an organic layer farm in the city of Piraquara, PR, Brazil.

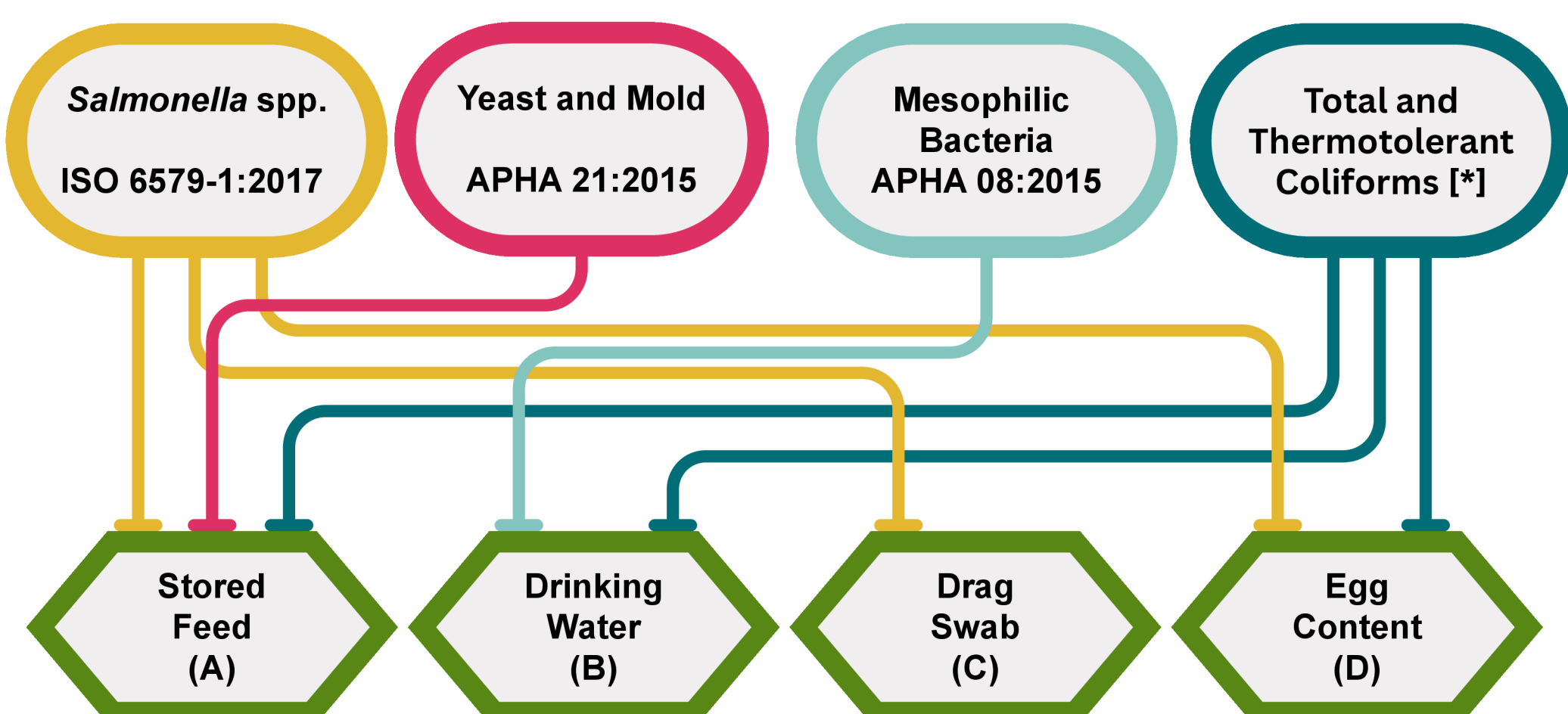
METHOD

Samples of stored feed (A), animal drinking water (B), drag swab (C) and egg content (D) from the three coops present on the property were collected twice, with a one-year interval.



Figure 1. a. Sampling of stored feed from plastic storage drum b. Sampling of drinking water from a faucet connected to the reservoir that supplies the poultry waterers. c. Drag Swab being performed inside one of the coops. d. Eggs inside the storage part of a rollout nest box. e. Entrance of a coop with the feed storage visible, all coops had a lime tray for disinfection of shoes when entering for handling of animals and distribution of feed.

The samples were assessed for *Salmonella* sp. detection (Samples A, C and D), total and thermotolerant coliform counts (Samples A, B and D), noting that samples A and D were initially analyzed through the most probable number (MPN) and, on the second occasion, through the total plate count (TPC). Additionally, mesophilic bacteria (Sample B) and yeast and mold counts (Sample A) were also performed. [3]



*B. APHA/AWWA/WEF 9221:2012. A,D. ISO 7251:2005/ APHA:2015.

Figure 2. Schematic illustrating assays applied on the corresponding sample and method of assay developed.

RESULTS & DISCUSSION

No strains of *Salmonella* sp. were present in any sample. Water and eggs did not present coliform growth (<3MPN/mL or g). Mesophilic bacteria investigation showed <10 CFU/mL. Feed samples initially presented 460 MPN/g of total coliform growth, and in the second analysis, averaged $2,8 \times 10^3$ CFU/g between all coops; the yeast and mold count resulted in $9,00 \times 10^4$ CFU/g in the first analysis and $7,0 \times 10^4$ CFU/g on the second analysis.

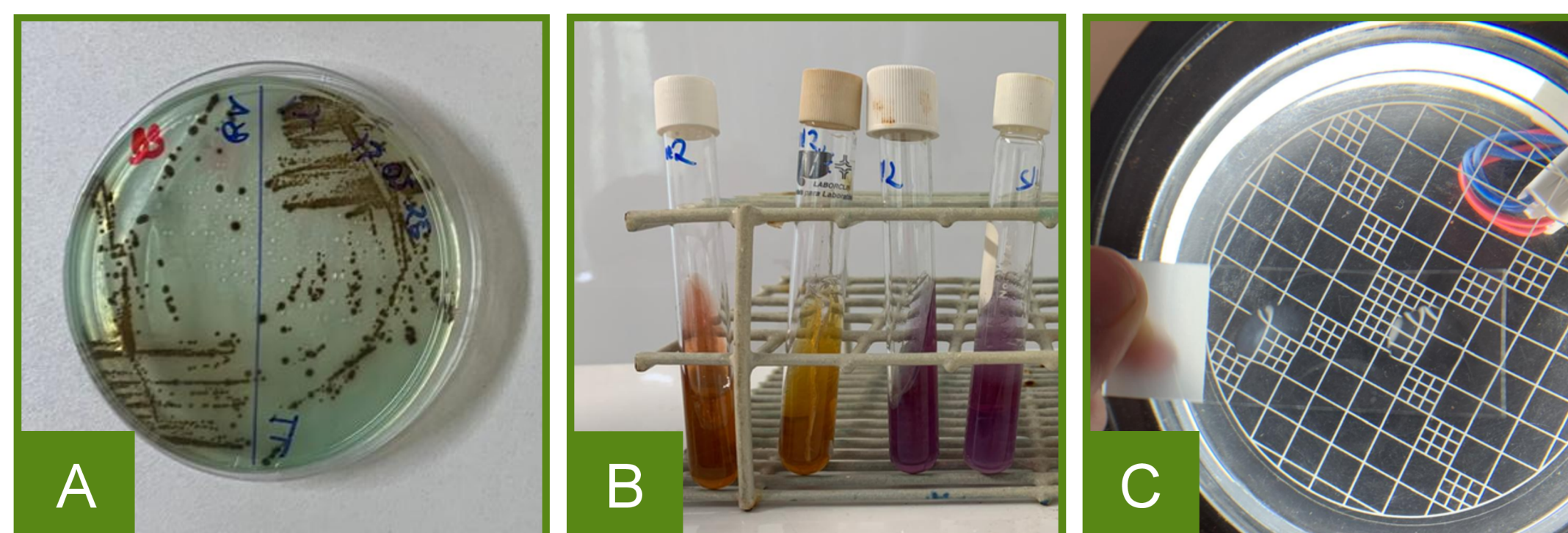


Figure 2. a. Suspicious *Salmonella* Colonies on Bismuth Sulfite Agar. b. Inoculated test tubes with Triple Sugar Iron Agar (left pair of tubes) and Lysine Iron Agar (pair of tubes to the right) of the same plate, showing acid slant and butt with slight reddish coloration on slant on TSI and alkaline slant and butt on LIA, with no H_2S production on both mediums. c. Negative coagulation response (right) to Polyvalent antisera for the serotyping of *Salmonella* sp. compared to positive control (left)

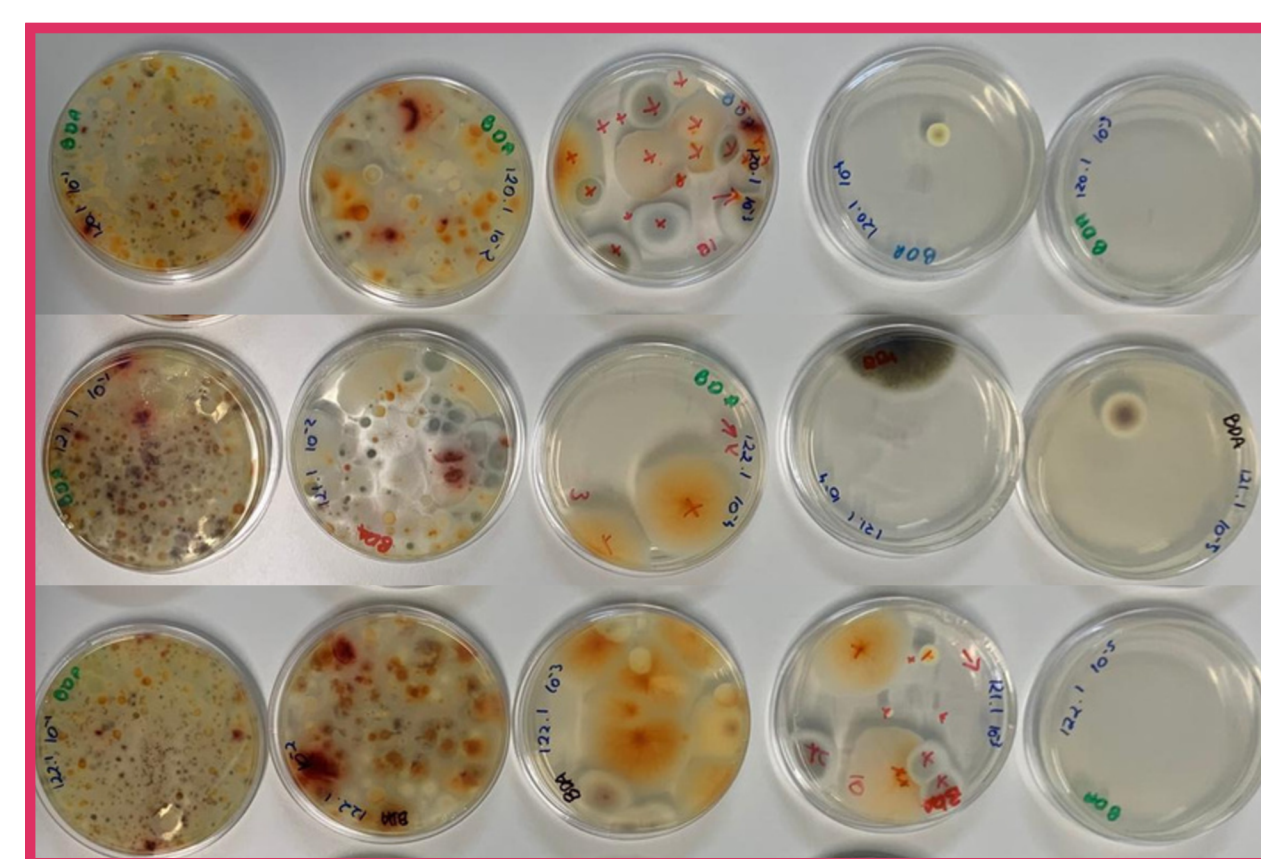


Figure 3. Mold growth on Potato Dextrose Agar on second analysis, each row corresponding to serial dilutions of feed analyzed from coops 1, 2 and 3 respectively.

Sample	Mold Count (Log CFU/g)
First analysis Feed (pool)	3,95
Second analysis Feed Coop 1	3,76
Second analysis Feed Coop 2	3,77
Second analysis Feed Coop 3	3,96

Table 1. Results from mold growth analysis

Analysis of compiled results showed that the storage of the feed must be improved, since coliforms, mold spores and toxins can pose a health risk to animals that consume highly contaminated feed.

CONCLUSION

The absence of *Salmonella* sp. and all other samples presenting a low to complete absence of contamination demonstrated the accomplishment of a hygienic and sanitary production flow.

ACKNOWLEDGMENTS

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REFERENCES

