Foods 2024 Conference

The 5th International Electronic Conference on Foods

28–30 October 2024 | Online

MDPI

Evaluation of the use of propolis and sodium hypochlorite as methods to control contamination of free-range eggs

Giovana Scuissiatto de Souza[1,2], Julia Unicki Philipp[2], Elisana Julek[1,2], Gabriela Campi Voltolin[2], Guilherme Souza Cavalcanti de Albuquerque[3], Julia Arantes Galvão [1,2]
Post-Graduation Program in Veterinary Sciences - Federal University of Paraná[1]
Quality Control and Food Safety Laboratory - Federal University of Paraná , Curitiba/Paraná, Brazil[2]
Federal University of Paraná [3]

INTRODUCTION & AIM

In recent years, the production of free-range eggs has increased due to growing consumer interest in animal welfare [2]. However, this production method introduces new sanitary challenges due to free-range housing, which can increase the microbiological risk [1]. Therefore it is essential to implement proper egg sanitization practices to avoid contamination by pathogens [3-4]. The use of propolis and sodium hypochlorite can be effective in improving the bacteriological quality of eggs, due to their antimicrobial properties. The aim of this study was to evaluate the effectiveness of 1% sodium hypochlorite and 30% propolis extract as methods of controlling egg contamination on a free-range farm located in southern Brazil.

METHOD

Eighteen eggs were collected and divided into three groups as shown in Figure 1.

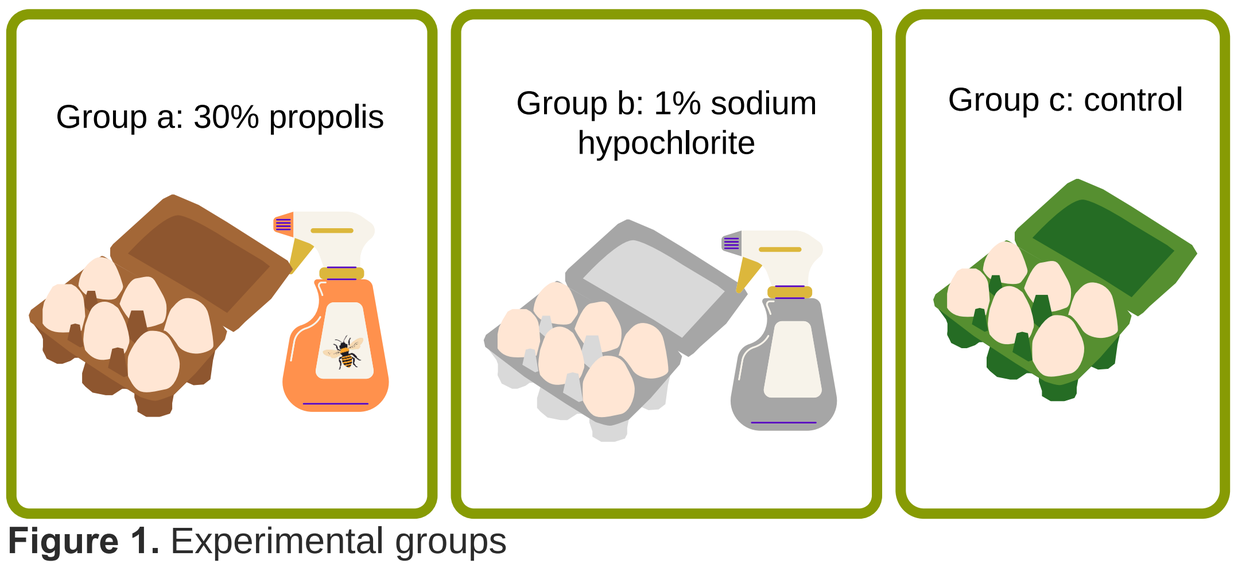

Figure 1. Experimental groups

Analysis:

- For shell analysis, 6 eggs from each group were rinsed in 0.1% buffered peptone water.
- For the contents, two yolks from each group were used, adding peptone water in a ratio of 1:9.

Mesophilic aerobes were counted using the plate count agar (PCA) method and colonies were counted after 48 hours of incubation (36ºC) [5].

RESULTS & DISCUSSION

The data from the microbiological analysis of the groups is shown in Table 1.

Table 1. Microbial counts groups after treatments

Treatment	Eggshell (log UFC/mL)	Egg Contents (log CFU/g)
Group a	0.6	0
Group b	1.3	0
Group c	3.26	4.78

CONCLUSION

It can be concluded that both methods were able to reduce the microbiological load of the eggshell and egg contents, with propolis being the most effective in this process.

ACKNOWLEDGMENTS

The authors thank the Coordination for the Improvement of Higher Education Personnel (CAPES) and National Council for Scientific and Technological Development (CNPq) for their support.

REFERENCES

1.Galvão, J.A.; Ribeiro, S.C.A.; Amaral, L.A.; Schmidt, V.; Souza, R.A.L.; Paulillo, A.C.; Rossi, D.A. Microbiological Vulnerability of Eggs and Environmental Conditions in Conventional and Free-Range Housing Systems. *Semina: Ciênc. Agrar*. **2018**, 39, 133–142.

2.McWhorter, A.R.; Chousalkar, K.K. From hatch to egg grading: monitoring of Salmonella shedding in free-range egg production systems. *Veterinary Research*, **2019**, 50, 1–9

3.Neto, J.P.S.; Souza, G.C.; Almeida, E.L.; Alves, L.B.; Lima, R.B.; Medeiros, R.H.S. Ocorrência de Aeróbios Mesófilos, Coliformes e *Salmonella* spp., em Ovos Comerciais Higienizados por Diferentes Métodos. *Rev. Craibeiras Agroecol.* **2019**, 4, 7717.

4.Soares, A.C.B.; Silveira, L.R.; Pereira, J.G.; Castro, L.L.S.; Meira, A.C.C.; Fagundes, G.M. Maintenance of Quality of Eggs Submitted to Treatment with Propolis Extract and Sanitizers. *Acta Sci. Anim. Sci*. **2022**, 44.

5.Downes, F.P.; Ito, K. *Compendium of Methods for the Microbiological Examination of Foods*; 4th ed.; American Public Health Association (APHA): Washington, DC, USA, **2001**; p. 676.