

Student challenge owner: UNIVERSITY OF ZAMBIA

UTILISATION OF ABATTOIR CHICKEN BLOOD INTO USEFUL PRODUCTS

Company: ROSS BREEDERS

Schedule: SEPTEMBER – DECEMBER 2022

Contact Person: DR JOYCE MUFUNGWE

Project background

In the previous student challenge, task was to identify abattoirs, classify and quantify abattoir waste produced by various abattoirs in Mazabuka and Lusaka and Chongwe Districts of Zambia. Results showed that available abattoir waste is mainly rumen contents and blood from cattle and blood and feathers from chickens. One abattoir namely Ross breeders has been identified. This is a poultry abattoir. In terms of capacity, it slaughters 26, 000 birds/day and from this produces 3x 1,500 litres of blood/day which are collected in tanks. Now, the abattoir has no use for the blood, so Lusaka city council collects the blood and disposes it off at a fee.



Figs 1&2: Chicken feathers and blood waste from Ross breeders, Zambia

In the same vein, there is a critical shortage of blood meal in the Zambia. The major agro-dealers spoken to on the phone mentioned that their blood meal supplies were being imported into the country from Namibia and South Africa. Thus gives us an opportunity to explore the avenue of converting blood abattoir waste product into useful products like blood meal.

Literature Review

Poultry blood is an abattoir waste product or by-product. It contains about 80-90% of protein and 90 g lysine/kg DM and small amounts of ash and lipids (Donkoh *et al.*, 1999; Makinde and Sonaiya, 2011). It can be used as an ingredient in animal feed, for swine, poultry, fish and other non-ruminant species when processed (Donkoh *et al.*, 1999). Fresh blood represents about 2-5% of the weight of live broilers (Aniebo *et al.*, 2009). Abattoir blood constitutes public health risk and is a nuisance in most slaughterhouses. It has potential to pollute air, water bodies and soil if not properly disposed off. It also attracts flies and other disease vectors. When collected for animal

feed, blood should be free from disease or pathogenic organisms (Alao et al., 2017). Nevertheless, blood is very difficult to dry and is a good medium for microbial spoilage due to its high moisture content (Donkoh *et al.* 1999).



Fig 3: Blood meal (Source: google)

Student tasks

1. Preservation of collected blood before processing
2. Determine nutrient composition of blood meal.
3. Assess safety of blood as a protein source in animal feeds i.e., do food safety assessment and bacteriological assessment.
4. Processing of abattoir blood into useful product e.g., blood meal, fertilisers etc.,
5. Promote reutilisation of abattoir blood waste into useful products e.g. In the food industry, blood is used as binding agents, colour enhancers, emulsifiers, fat replacers and meat curing agents.
6. Promote the development, production and distribution of affordable blood protein source
7. Environmental protection.
8. Cost benefit analysis of the products developed

Tasks

The student will address the project objectives by:

1. Quantify the amount of blood waste generated by the poultry abattoirs in Zambia
2. To assess the current practices done on blood generated by poultry abattoirs
3. To assess and create opportunities for poultry blood utilization in Zambia
4. Identify stakeholders to bring on board to partner with universities in processing the blood from poultry abattoirs e.g. In the food industry, blood is used as binding agents, color enhancers, emulsifiers, fat replacers and meat curing agents etc.

Deliverables

Project Outputs

1. Project Report
2. Training materials on production and utilization of abattoir blood waste

<ol style="list-style-type: none"> 3. Developed products e.g., blood meal, fertilisers etc 4. Dissemination materials on production and utilization of abattoir blood waste <p>Project Outcomes</p> <ol style="list-style-type: none"> 1. Alternative use of blood meal as a source of protein in animal feeds and any other product 2. Increased employment and income creation through blood meal production and other useful products 3. Environmental protection – prevent blood waste going into streams and rivers
<p>Mentoring plan:</p> <ul style="list-style-type: none"> • Introduction to the tasks – April 2022 • Weekly mentoring by Zambian supervisors • Monthly presentation of work done by the students • Final report and power point presentation – August 2022 <p>Supervisors:</p> <ul style="list-style-type: none"> • Dr Joyce Mufungwe – University of Zambia • Dr Himoonga Moonga– University of Zambia
<p>Evaluation plan:</p>

References

- Anieboa, A.O., Wekhea., S.N. and Okolib, I.C. (2009). Abattoir blood waste generation in Rivers State and its environmental implications in the Niger Delta. *Toxicological & Environmental Chemistry*, Vol. 91, No. 4, June 2009, 619–625
- Donkoh, A., Atuahene, C.C., Anang, D.M and Ofori, S.K (1999). Chemical composition of solar-dried blood meal and its effect on performance of broiler chickens. *Animal Feed Science and Technology*, 81, 299 -307.
- Alao, B.O., Falowo, A.B., Chulayo, A. and Muchenje, V (2017). Review The Potential of Animal By-Products in Food Systems: Production, Prospects and Challenges. *Sustainability*, 9, 1089.
- Makinde, O.A. and Sonaiya, E.B (2011). Utilization of sun-dried maize offal with blood meal in diets for broiler chickens. *Open Journal of Animal Sciences*, 106-111

