

Utilization of Poultry Waste

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SUMMARY

By-products from different poultry waste sources are currently being utilized for beneficial purposes. Chicken processing plants all over the world generate large amount of solid by-products in form of heads, legs, bones, viscera and feather. These wastes are often processed into livestock feed, fertilizers and pet foods or totally discarded. In the case of edible items, meat by-products constitute an excellent source of nutrients like essential amino acids, minerals and vitamins (Edible meat by-products contain many essential nutrients. Some are used as medicines because they contain special nutrients such as amino acids, hormones, minerals, vitamins and fatty acids. Waste products from the poultry processing and production industries must be efficiently dealt with as the growth of these industries depends largely on waste management. Blood proteins, especially those found in the plasma fraction, have relevant technological properties like gelatin, foaming agents and emulsification that prompted the use of blood-derived products as value-added ingredients in the food industry and as dietary supplements. Available information pertaining to the utilization of by-products and waste a material from poultry and their processing industries has been reviewed here.

INTRODUCTION

The byproduct such as blood, liver, kidney, spleen tripe has high nutritive value. The poultry byproduct production was 307.1 million ton in the year 1992 and 1993. With this large production, thousands of tons of organic by-products in the form of viscera, feet, head, bones, blood and feathers are generated (Zhu *et al.*, 2010). The viscera constitute about 30% of these wastes while feather could be up to 10% (Jamdar and Harikumar, 2005). Chicken feather contains nutrients approximately 19% protein, 1% lipids, and 8% water (Thyagarajan *et al.*, 2013). Chicken claw are regarded as waste from chicken slaughter house and produced in large quantities. Efficient utilization of by-products is important for the profitability of the industry. In the past, by products were a favorite food in Asia, but health concerns have led to an increased focus on non-food uses, such as pet foods, pharmaceuticals, cosmetics and animal feed (Rivera *et al.*, 2000). One of the most common methods of converting solid wastes to value added products prior to these regulations is via the rendering process of animal wastes (Salminen and Rintala, 2002). The fat can then be used as raw material for producing cooking oil, soap, detergents and cosmetics while the protein residues are dried and grounded into feed meal such as meat and bone meal (MBM), feather meal and meat meal for livestock (Shareefdeen *et al.*, 2005).



Nutritional importance of poultry waste

Benefits:

1. Good source of protein.
2. Useful in controlling blood pressure.
3. Beneficial in managing and reducing weight.
4. Helps in preventing skin disorders.
5. Lower risk of cholesterol and heart disorders.
6. Edible meat by-products contain many essential nutrients (Devatkal *et al.*, 2004)

Types of poultry waste:

Sr No	Types	Uses
1	Feathers	Bedding material, decorative purpose, sporting equipment, manure or fertilizers, feather meal.
2	Blood	blood meal
3	Heads	poultry meal
4	Gizzard and proventriculus	Edible, source of chitinolytic enzyme
5	Feet	Soup technical fat/poultry grease
6	Intestines and glands	Sportgats, meat meal, poultry grease and active principles (hormones and enzymes).
7	Liver	Braised, broiled, fried, in loaf, patty and sausage
8	Kidney	Broiled, cooked in liquid, braised, in soup, grilled, in stew.
9	Skin	Gelatin
10	Spleen	Fried, in pies, in blood sausages.
11	Bones	Gelatin soup jellied products, rendered shortening, mechanically deboned tissue

(Ockerman and Hansen 2006, Sams 2001)

Feather meal:

Feathers are converted to feather meal with the use of animal feed, organic fertilizers and feed supplements, as it is made up of 90% protein and are rich in amino acids like cystine, arginine and threonine. Most common methods of feather meal production are hydrothermal process where feathers are digested under high pressure at high temperature. However, hydrothermal treatment leads to destruction of essential amino acids like methionine, lysine, tyrosine, tryptophan that accounts to poor digestibility and low nutritional value (Ekta and Rani, 2012)

Manual application as a fertilizer

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Compositing the manure

It is the easiest method for utilizing the manure in fields. However, it will lead to following ill effects like the Surface and ground water pollution. Problems with odors and insects. Over accumulation of manure and trace elements leading to reduced crop yields. Compositing the manure Composting is the fast aerobic degradation of biodegradable organic waste, taking typically 4–6 weeks to reach a destabilized material. The composted material is odorless and fine textured with low moisture content. Composted poultry litter is easy to handle and pathogen free. Moisture and C/N ratio have a major influence on a successful composting process. The moisture content has a influence on the decomposition rate and the tendency to stabilize, as metabolic heat generation during decomposition drives evaporation. (Kelleher et al. 2002).

CONCLUSION

Poultry waste is one of the large pollutants if not disposed. Feathers can be treated chemically or biologically with microbes to improve the nutritive value of feather wastes which can be used as animal feed. They can also be converted into feed supplements, biodiesel, and biodegradable plastic and organic fertilizer. The offal's are utilized by various methods like rendering, burial, controlled land filling, composting and anaerobic digestion. Rendering produces meat-bone meal which may be used as animal feed or fertilizer. Composting reduced the pathogens. The compost is used as soil fertilizer. Poultry litter contains C, N, P, chlorine, calcium, magnesium, and sodium, manganese, ferrous, copper and arsenic. Altogether, poultry wastes can be effectively utilized if properly treated to reduce the ill effects and a range of value added products like fertilizer, biodiesel, animal feed, electricity, bone meal and biodegradable plastic can be produced.

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