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Title: "Meat, Fish and Poultry Processing Wastes" in Journal of the Water Pollution Control Federation

William T. McComis and John H. Litchfield

June 1988

AP-42 Section
Reference
Report Sect. 2
Reference 7

Industrial Wastes

Meat, fish, and poultry processing wastes

William T. McComis, John H. Litchfield

MEAT PROCESSING

A National Technical Information Service (NTIS) bibliographic publication presented 20 new citations on meat processing wastes for the period 1976-1987.[1] Reviews on meat processing industry wastewater treatment and by-products recovery covered coagulation and flocculation,[2] microbiological and enzymatic treatment,[3] rendering waste treatment,[4-6] and protein recovery.[7,8]

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Coagulation with hydrochloric acid and polyacrylic acid was used in the sedimentation treatment of blood-containing wastewater from sardine processing.[33]

POULTRY PROCESSING

Solids removal from chicken-processing wastes was improved by installing two enclosed nonvibratory liquid/solid separators having 200 μm polyester self-cleaning screening sleeves.[34] Flow rates ranged up to 90 m^3/hour during processing of over 250 000 birds/week. Settleable solids in the effluent were reduced from 900 to 300 mg/L (66%) with an annual savings of approximately $59 500.

Finlayson, *et al.*[35] investigated the treatment of poultry processing wastewater with the emergent plants *Typha domingensis, T. orientalis,* and *Schoenoplectus validus* and the floating plants *Salvinia molesta, Eichhornia crassipes* and *Spirodela oligorrhiza. T. domingensis,* and *S. oligorrhiza* grew the best of all the species at a 60% concentration of the waste. They concluded that treatment resulted from physical filtration rather than substrate uptake by the plants.

According to Bode,[36] aerobic treatment of poultry offal meal manufacturing wastewater was slightly better than combined anaerobic-aerobic treatment. However, anaerobic treatment gave reductions in the quantities of nitrogen compounds, and combined anaerobic aerobic treatment reduced sludge accumulations and energy costs.

Hanaki, *et al.*[37] found that the degradation of egg albumin in a two-phase (acidogenic and methanogenic) anaerobic digestion system required a longer hydraulic retention time (approximately 5 days) than in a conventional acidogenic reactor. At hydraulic retention times of 0.9 and 12.9 days, 24 and 87% of the albumin was hydrolyzed, respectively, but at the latter time only 50% of the protein was converted to acids. The acidogenic reactor in the two-phase system did not produce sufficient acid from albumin to support methane production.

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Fruit, grain, and vegetable wastes

M. Brett Borup, Guy A. Hesketh, John Zirschky

GENERAL

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Coagulation with hydrochloric acid and polyacrylic acid was used in the sedimentation treatment of blood-containing wastewater from sardine processing.[33]

POULTRY PROCESSING

Solids removal from chicken-processing wastes was improved by installing two enclosed nonvibratory liquid/solid separators having 200 μm polyester self-cleaning screening sleeves.[34] Flow rates ranged up to 90 m^3/hour during processing of over 250 000 birds/week. Settleable solids in the effluent were reduced from 900 to 300 mg/L (66%) with an annual savings of approximately $59 500.

Finlayson, *et al.*[35] investigated the treatment of poultry processing wastewater with the emergent plants *Typha domingensis, T. orientalis,* and *Schoenoplectus validus* and the floating plants *Salvinia molesta, Eichhornia crassipes* and *Spirodela oligorrhiza. T. domingensis,* and *S. oligorrhiza* grew the best of all the species at a 60% concentration of the waste. They concluded that treatment resulted from physical filtration rather than substrate uptake by the plants.

According to Bode,[36] aerobic treatment of poultry offal meal manufacturing wastewater was slightly better than combined anaerobic-aerobic treatment. However, anaerobic treatment gave reductions in the quantities of nitrogen compounds, and combined anaerobic aerobic treatment reduced sludge accumulations and energy costs.

Hanaki, *et al.*[37] found that the degradation of egg albumin in a two-phase (acidogenic and methanogenic) anaerobic digestion system required a longer hydraulic retention time (approximately 5 days) than in a conventional acidogenic reactor. At hydraulic retention times of 0.9 and 12.9 days, 24 and 87% of the albumin was hydrolyzed, respectively, but at the latter time only 50% of the protein was converted to acids. The acidogenic reactor in the two-phase system did not produce sufficient acid from albumin to support methane production.

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Fruit, grain, and vegetable wastes

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GENERAL

A review of microbial and enzymic processes for the treatment of food processing wastes including processes for chemical com-