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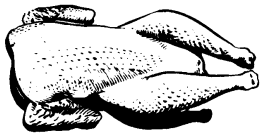

PROCESSING TIP . . .

MEASURING PRODUCT LOSS BY WASTEWATER ANALYSIS

Loss of product in a processing plant can be determined by measuring the concentration of organics in wastewater and determining the amount of wastewater discharged. When these data are collected the **"pounds equation"** can be used to determine product loss.

$$\frac{\text{gallons of wastewater}}{1{,}000{,}000} \times 8.34 \times \text{Biochemical } 0_2 \text{ Demand (BOD) analysis in mg/L} = \text{pounds}$$

mg/L = milligrams per liter = parts per million (ppm)

Example Problem

- 250,00 birds @ 5 pounds live weight = 1,250,000 lbs
- 7 gallons per bird x 250,00 birds = 1,750,000 gallons of wastewater
- Biochemical Oxygen Demand (BOD) = 2,500 mg/L
- Offal yield 25 percent of live weight = 312,500 pounds offal
- Chicken is 75 percent water
- One pound of BOD = one pound of dry weight organic matter

The Calculation

$$\frac{1{,}750{,}000 \text{ gallons}}{1{,}000{,}000} \times 8.34 \times 2{,}500 \text{ mg/L} = 36{,}490 \text{ pounds BOD}$$

$$\frac{36{,}490 \text{ lbs BOD}}{0.25} = 145{,}960 \text{ lbs offal (offal is 75\% water)}$$

1,250,000 lbs live weight x 25 percent offal = 312,500 lbs offal

$$\frac{145{,}960 \text{ lbs of offal in wastewater}}{312{,}500 \text{ pounds total offal}} = 46.7\% \text{ of offal is in wastewater}$$

These numbers are approximate average wastewater values and water use by broiler processors. As

you can see, a significant amount of offal can be lost to the wastewater. If the processor is using chemical flocculation Dissolved Air Flotation (DAF) which produces DAF solids with little value as compared to offal with a value of 2 cents per pound, the product value differential is $2,900 per day.

A system that recovers the offal in its primary form rather than DAF skimmings can increase the profitability.

Such systems may benefit the plant in terms of waste minimization, improved screening and/or air assisted flotation.

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