Salmon with a Side of Plastic? Microplastics are Contaminating Vancouver’s Aquaculture

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The Problem
Microplastic contaminated fishmeal is fed to salmon, which can harm salmon consumers.

- Microplastics are plastics less than 5mm in length
- Surface fish eat micro plastics in the ocean
- Fish meal is produced from surface fish
- Aquaculture salmon are fed micro plastic-contaminated fish meal.
- Chemicals in microplastics leach into salmon fat tissue
- Humans ingest microplastics and related chemicals.

The Solution:
Converting Food Waste to Salmon Feed with Insects

- Food Waste Sources
  - Homes
  - Schools
  - Supermarkets and Restaurants
  - Agriculture
  - Trash collected and sorted by city

- By-products of insect production such as fertilizer sold to support process
- Insect meal fed to locally farmed salmon
- Insect meal and insect oil
- Larvae cooked, dried, and ground into insect meal

- Life Cycle of Black Soldier Fly
  - Eggs
  - Larvae
  - Pupa
  - Adult

Cost Benefit Analysis
- Initial Larvae Costs
- $1 million in annual costs
- Billions in health costs saved
- Microplastic free fish feed
- Reduces global warming
- Sellable by products

Implementation & Assessment
- Partner with the City of Vancouver to implement trash pick up
- Contact Enterra Feed about using food waste to raise fly larvae
- Partner with Mowi Salmon Farm to test the quality of fish fed with insect meal

Human Health Impacts
- Polypropylene
- Polyethylene
- Polystyrene
- The most common monomers found in salmon fat
- Breast cancer
- Inflammation of skin tissue
- Infertility and/or birth defects
- Weakened Immune System

Key References
Coffey, T., James, F., & O’Dowd, S. J. (2012). Microplastics in juvenile Chinook salmon and their invertebrate environments on the east coast of Vancouver Island, Environmental Pollution, 261, 133-160.