



Animal Protein and Fat Recovery Systems

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Innovations • Solutions

Animal Protein and Fat Recovery Systems

Opportunities

1. Processing plant:
 - Water re-use filtration, reduce water consumption
2. Rendering plant:
 - EQ tank solids collection, reduce load on WWT

Processing Plant – Water Reuse Filtration

Water Reuse Filtration

For Washdown Filter System and Chiller Reuse System

Objectives:

1. Reduce water consumption, increase water reuse rate
2. Reduce nozzle plugging and maintenance frequency
3. Generate high value protein product

Water Reuse Filtration

ALSI Application

Liquid / Liquid Separator (LLS):

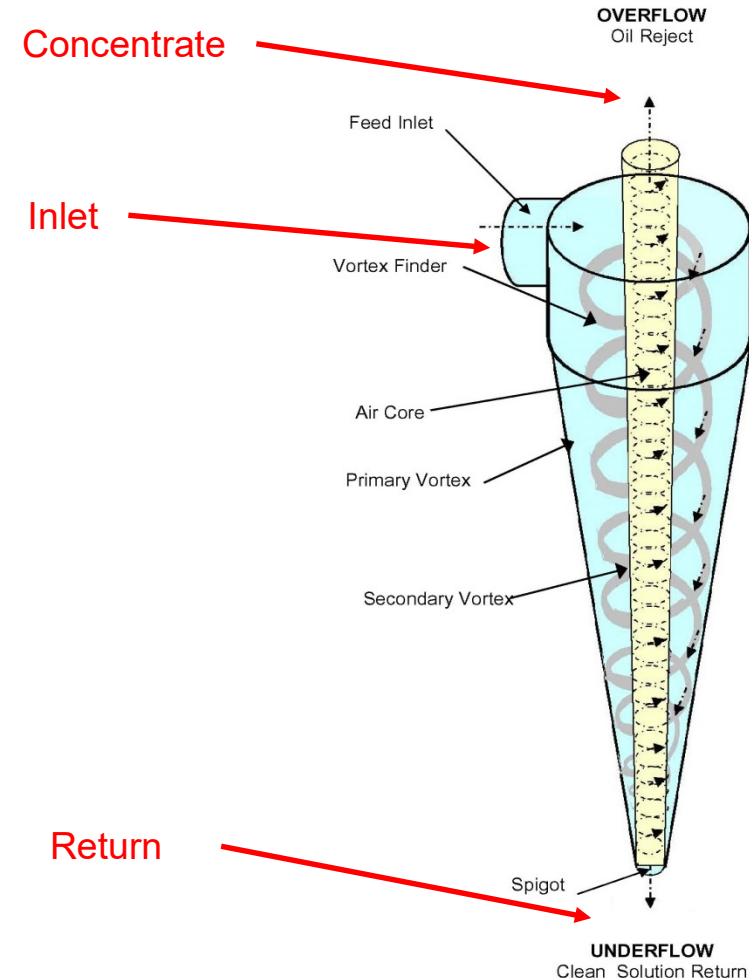
- Hydrocyclone technology
- Continuous separation of protein/fat



Liquid / Liquid Separation (LLS)

Principle of Operation

- Hydrocyclone technology mechanically divides a homogenous stream into fractions by density
- Liquids and particles with $SG < 1.0$ report to **CONCENTRATE OVERFLOW** for removal (includes protein and fats)
- Liquids and particles with $SG \geq 1.0$ report to **RETURN UNDERFLOW** (cleaned water)
- The fraction reporting to each outlet can be varied by design but is essentially fixed in operation.



LLS Pilot Testing

Sample Collection Location/Technique/Results

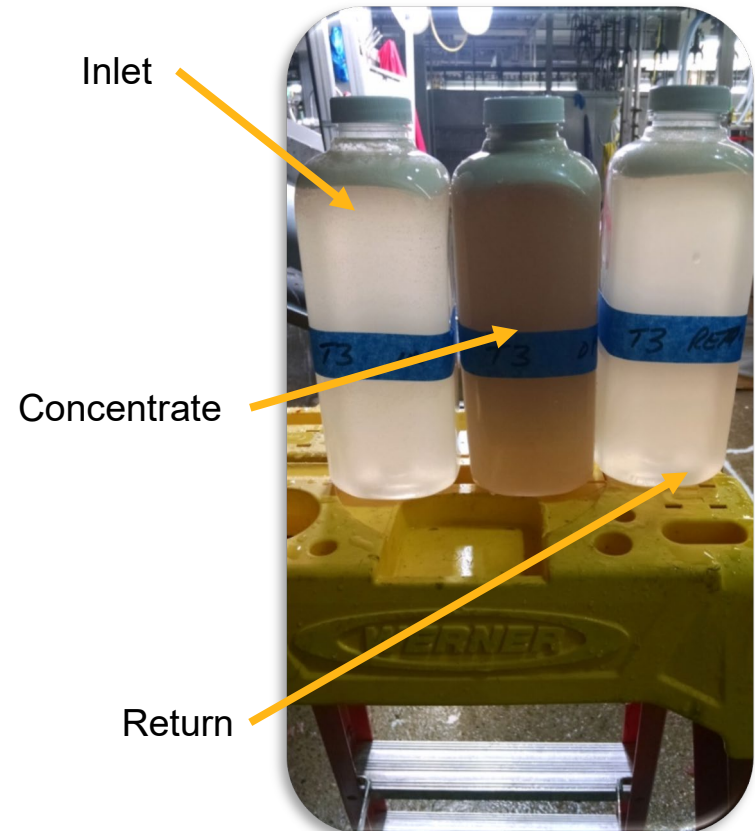


Pilot connection to existing Rocket Filter

Pilot connection to Rocket Filter



LLS pilot system



Samples from LLS pilot testing

LLS Pilot Test Results

Wash Down Water

Analysis of 3 Sets of Water Samples

Specific Gravity – Chicken Fat SG 0.84 *			
Reading	Inlet	Return	Concentrate
#1	0.8	1.0	0.8
#2	1.0	0.9	0.8
#3	1.0	1.0	0.8

Total Suspended Solids (mg/liter)			
Reading	Inlet	Return	Concentrate
#1	306	170	14,898
#2	566	542	11,379
#3	661	330	11,498

* DAR Pro Ingredients



ALSI Lab Testing

Motor Oil SG 0.88*

Inlet % By Volume	Return/Clean % By Volume	Removal Efficiency
3	0.3	97%
5	0.45	95.5%
10	8.10	91.9%

* Wolf's Head Heavy Motor Oil SAE 30W

LLS Pilot Test Results

Separating Chicken Protein/Fat from Rinse Water

- LLS Return water can be reused, reducing water consumption
- Filters 650,000 gallons per day of rinse water reducing the removal and cleaning cycles of spray nozzles
- Collects the chicken protein/fat to create salable product

Chicken protein/fat removed LLS pilot and chilling



Rendering Plant – EQ Tank Solids Collection

EQ Tank Solids Collection

ALSI Application

Palin® Consolidator

- Flotation technology
- Maximize concentration and value of protein/fat product stream



EQ Tank Solids Collection

Palin® Consolidator Pilot Test

- ALSI conducted pilot test of Palin® Consolidator and floating weir in the existing outdoor EQ basin tank at poultry facility in Missouri.
- Pilot test proved that the floating weir can skim the EQ surface sludge and Palin® Consolidator can float and concentrate it for removal by the integral scraper with no added chemicals.
- Protein / fat collection is proven.
- The study shows sufficient protein content for further processing.
- Reduction of solids loading to wastewater treatment.

EQ Tank Solids Collection

Palin® Consolidator Pilot Test Equipment



Floating Collection AutoWeir†



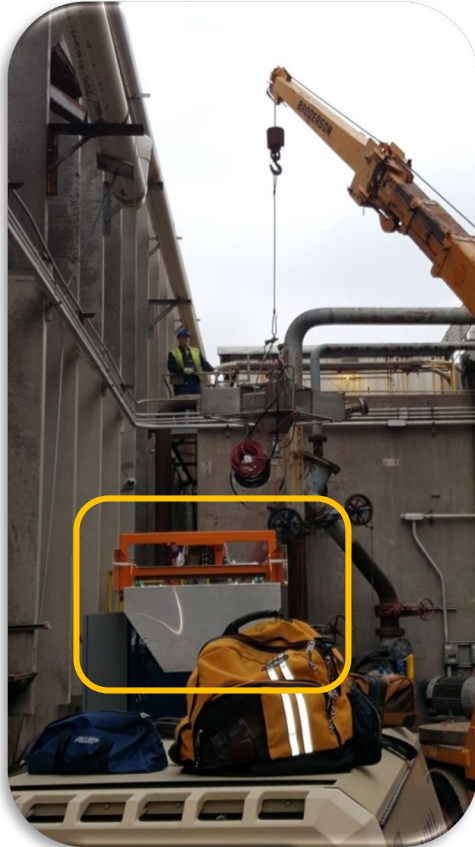
Palin® Consolidator

EQ Tank Solids Collection

Palin® Protein/Fat Consolidator Pilot Test



Floating AutoWeir skimming solids in EQ Tank



Palin® Protein/Fat Consolidator beside EQ Tank



Protein/Fat product rolling into Dewatering Bag System



Dewatering Bag System next to EQ Tank



Protein/Fat product removed by Palin® scraper



Thank you



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