

# **Local Biodiesel Conference**

**Golden, Colorado  
July 13, 2007**

**Feedstock Processing Overview**

BioFuel

Technologies llc

# Fighting the Good Fight

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# Planning an Oil Seed Crusher

## Why bother?

- Internalize fuel costs for farming
  - Energy = 30% of farming costs (primarily diesel)
- All other feedstocks are spoken for

## What oilseed crushing is really about:

- MEAL and FEED
- Oil is a sidestream
- **Develop meal markets first**

# Planning an Oil Seed Crusher

- **Economics depend on value of meal**

## **What are your meal market opportunities?**

- 1. Animal feed (Soybean, sunflower, canola, mustard)**
  - High protein + residual oil + organic → higher value
  - Meal Cake or Pellets
- 2. Soil conditioning (Mustard)**
  - Organic fungicide, herbicide, insecticide
- 3. Pellets for bio-energy**
  - Low-value product

## **Wholesale oil value may be high**

- Organic sunflower oil wholesale value ~ \$4/gal
  - Can you afford to internalize costs at this value?

# Sizing Logistics

## 1 million Gallons/Year

- **Storage**
  - Seed (annual production): **27,000 tons (900,000 bu) Soybeans; 13,000 tons (260,000cwt) Sunflower, 14,000 tons (280,000 cwt) Canola, Mustard**
  - Meal (one week prod): **470 tons Soybeans; 200 tons Sunflower, Canola, Mustard**
  - Oil: **25,000 gallons (one week production)**
  - Biodiesel: **25,000 gallons (one week production)**
- **Crushing capacity**
  - **100 tons/day Soybeans; 50 tons/day Sunflower, Canola, Mustard**
- **Biodiesel Production**
  - Reactor capacity: **1500 gallons (two batches per day)**
  - Chemical process equipment (Pumps, Pipes, Valves, Heaters, Separators, etc.)
  - Transportation and Transfer capability

# Feedstock Processing

**Production Process**

## **Mechanical extraction**

- Lower oil extraction yields than chemical extraction
- Simple, reliable, affordable, safe, organic
- *Residual oil in meal provides higher meal value*

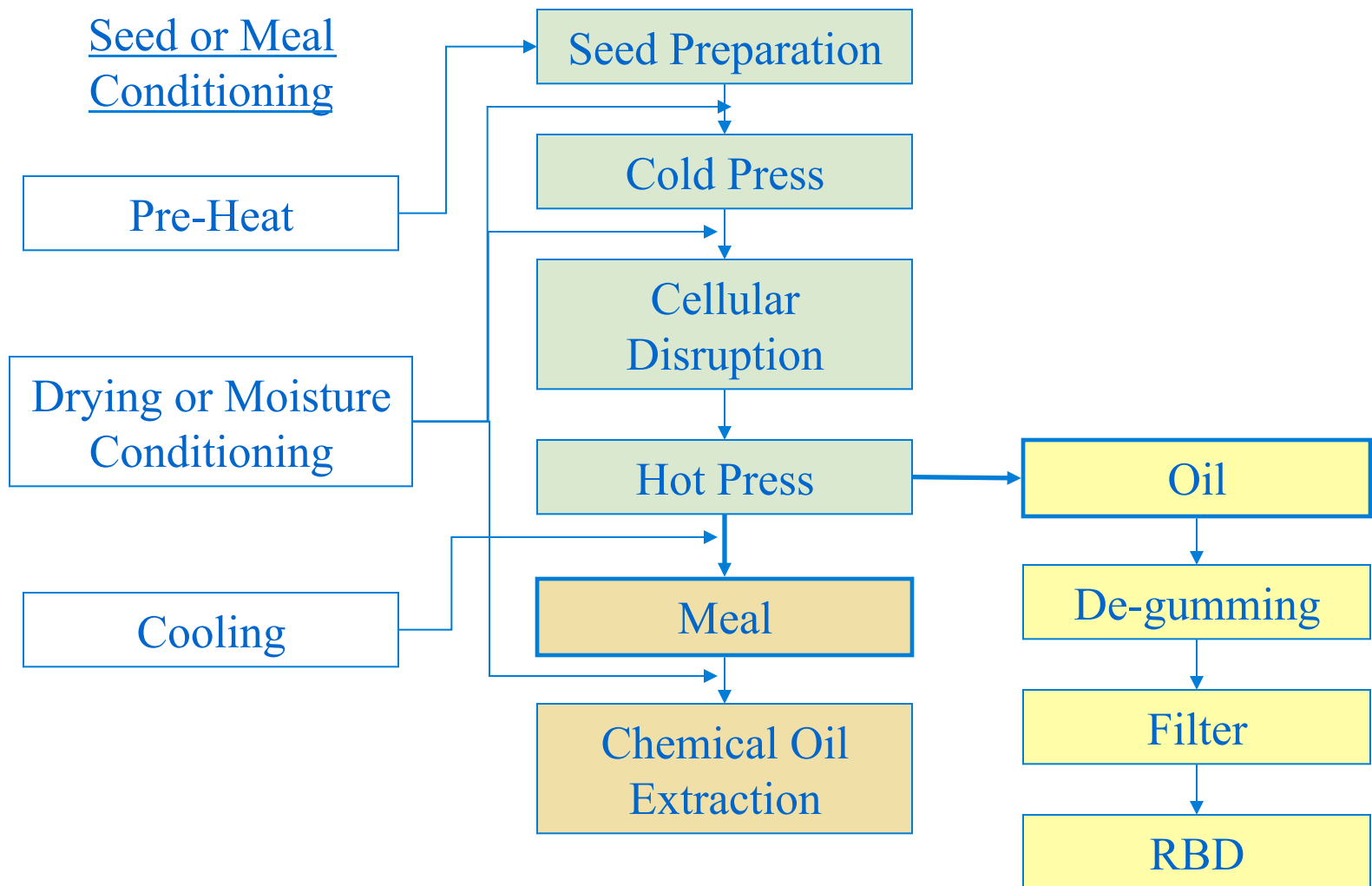
## **Chemical extraction**

- Hexane extraction: too hazardous and tech intensive for small scale
- Not economically viable at small scale

# Crude Fat and Oil Refining

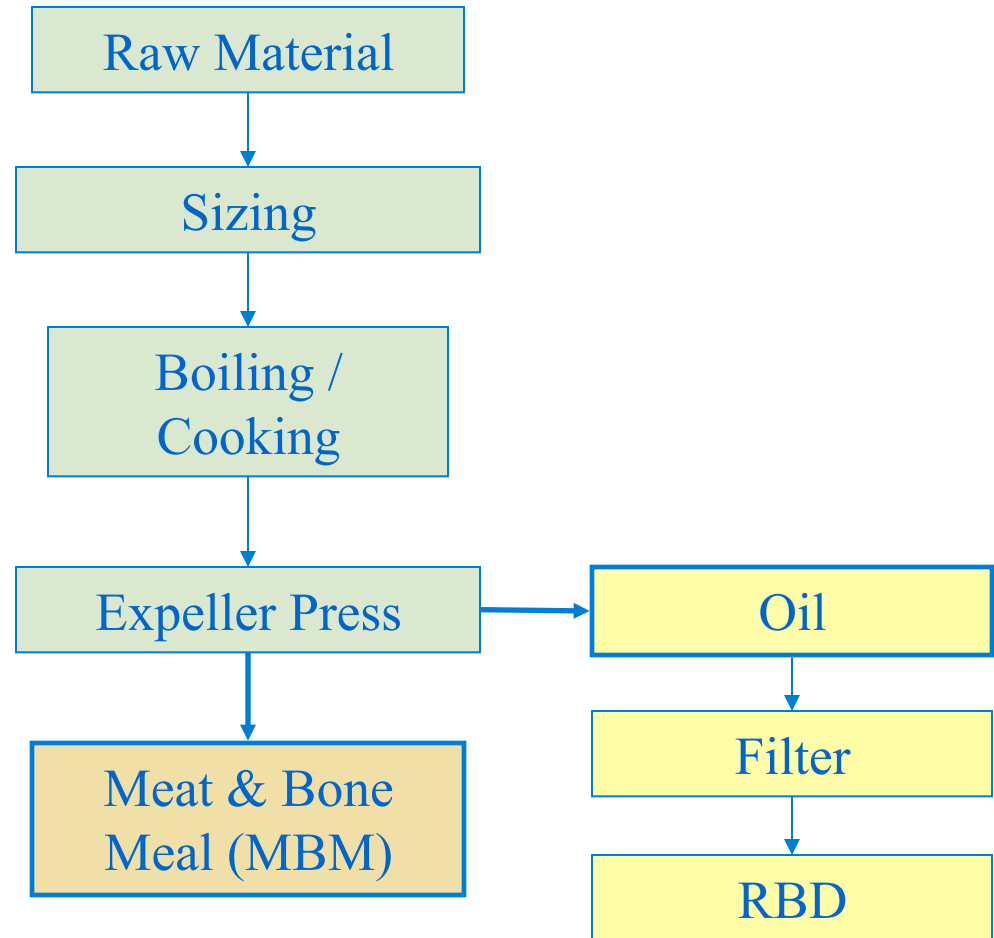
- **Minimum refining for biodiesel production**
  - De-gumming, de-watering, filtering
  - Neutralize fatty acids at biodiesel plant
- **Other oil markets may require secondary refining**
  - Including deodorizing, bleaching, winterizing

# Mechanical Extraction Process



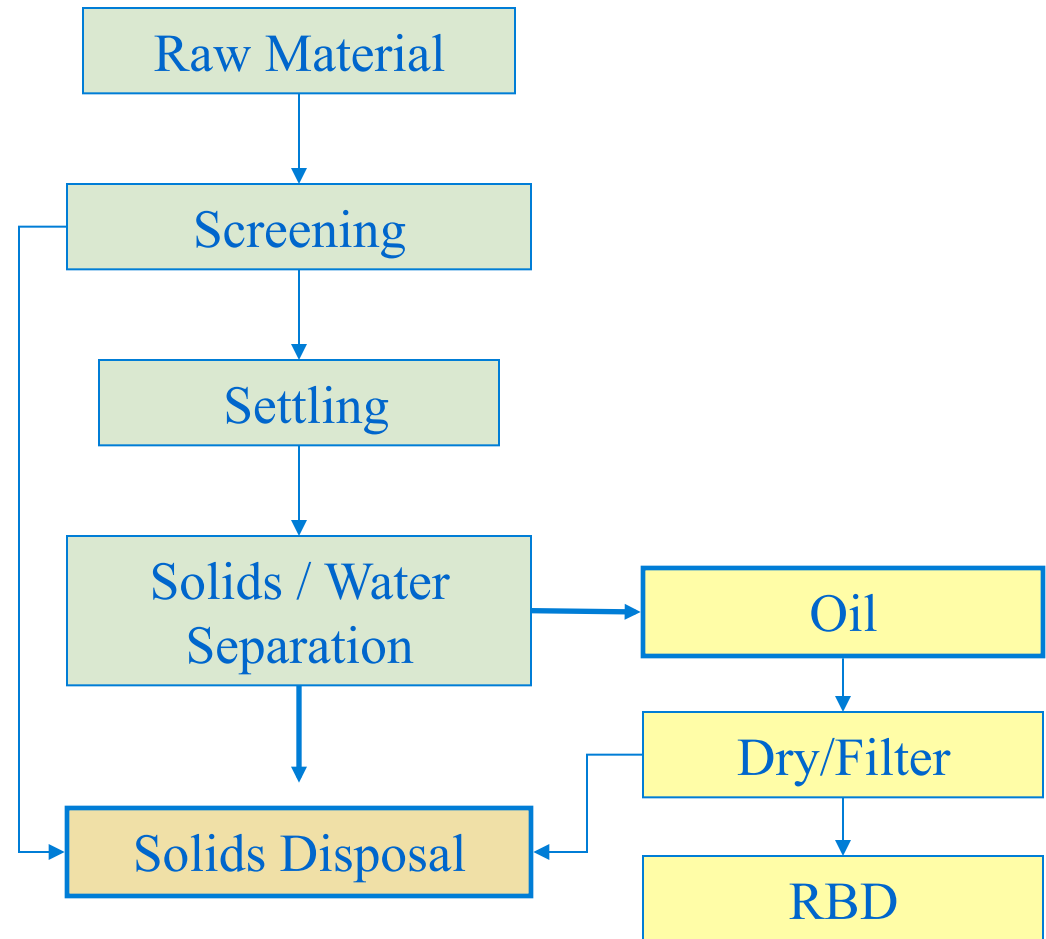
“Soft” Seed Oil Pressing

# Mechanical Extraction Process



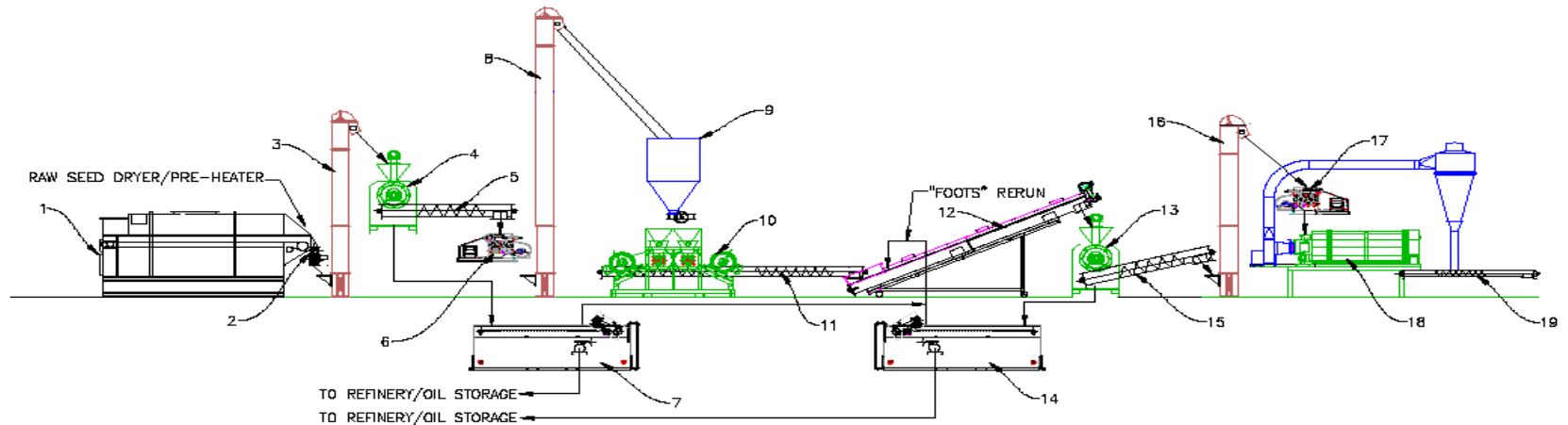
Animal Fat Processing

# Mechanical Extraction Process



Restaurant Grease Processing

# Crushing Plant



ITEM NO:	DESCRIPTION	ITEM NO:	DESCRIPTION
1	BELT-O-MATIC DRYER	11	9" X 20FT. EXTRUDER DISCHARGE SCREW
2	DRYER DISCHARGE SCREW WAIRLOCK	12	9" X 20 FT. VENTED SCREW CONVEYOR
3	U1-440 BUCKET ELEVATOR X 16FT. D.H.	13	INSTA-PRO MODEL 5005 OIL PRESS
4	INSTA-PRO MODEL 5005 OIL PRESS	14	INSTA-PRO 4FT. X 12FT. OIL SCREENING TANK
5	12" X 10FT. CUT&FOLD PRESS DISCH. SCREW CONVEYOR	15	12" X 10FT. CUT&FOLD PRESS DISCH. SCREW CONVEYOR
6	FERREL-ROSS M-1018 ROLLER MILL	16	U2-800 BUCKET ELEVATOR X 16FT. D.H.
7	INSTA-PRO 4FT. X 12FT. OIL SCREENING TANK	17	FERREL-ROSS M-1018 ROLLER MILL
8	U1-440 BUCKET ELEVATOR X 26FT. D.H. W/SERVICE PLATFORM	18	INSTA-PRO MODEL 950 6TL. STEEL DRUM COOLER
9	125CU.FT. SURGE BIN	19	COOLER DISCHARGE CONVEYOR (BY CUSTOMER)
10	INSTA-PRO MODEL 2000DB EXTRUDER		

Footprint: 110 ft x 30 ft

# BioFuel Technologies llc

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