

Camelina Oil in Human Consumption

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Ag-Industrial Background

- ▶ Archeological excavation proves its existence in the Bronze age(1500-400 B.C) and Iron Age(400 B.C-500 A.D) in Europe, Russia and Scandinavia.
- ▶ Iron Age-Cultivation of camelina doubles in Europe as a source of edible oil.
- ▶ Beginning of 20th century to 1930's: Cultivation in France, Belgium, Holland and Russia continued.
- ▶ New oil crops such as olive, sunflower, canola took over the land in competition with camelina.
- ▶ Camelina is emerging as a “new crop” today in America

Physiological Traits

- ▶ Adaptable to many different climate and soil conditions.
- ▶ Short seasoned, winter resistant species.
- ▶ High resistance to diseases, insects, drought and frost.
- ▶ Suitable as a rotational crop in the PNW.
- ▶ Low input crop
 - Low nitrogen demand
 - Chemical protection not required
 - Resists weeds and supports other crops

Attributes

- ▶ Excellent source of omega 3 fatty acids(35-40%).
- ▶ High Vitamin E content
- ▶ Oxidative stable and palatable(475° smoke point)
- ▶ 18 month shelf life
- ▶ 33-38% oil content in seeds
- ▶ 40% protein content in meal byproduct
- ▶ Good yields of 1,000 lbs/Acre in Ritzville.

Nutritional Significance

- ▶ 2:1 ratio of omega 6's to omega 3's
 - *15:1 ratio of average western diets*
- ▶ Omega 3's help reduce heart disease, CVD, inflammation and cancer.
- ▶ Camelina oil can help reduce cholesterol and triglycerides with those that have high levels.
- ▶ High in natural antioxidants to fight off free radicals.

Markets

- ▶ High quality cooking oil, salad oil
- ▶ Food additive
- ▶ Personal care products and cosmetics
- ▶ Biodegradable lubricants
- ▶ Value added livestock feed and supplement
- ▶ Biodiesel industry

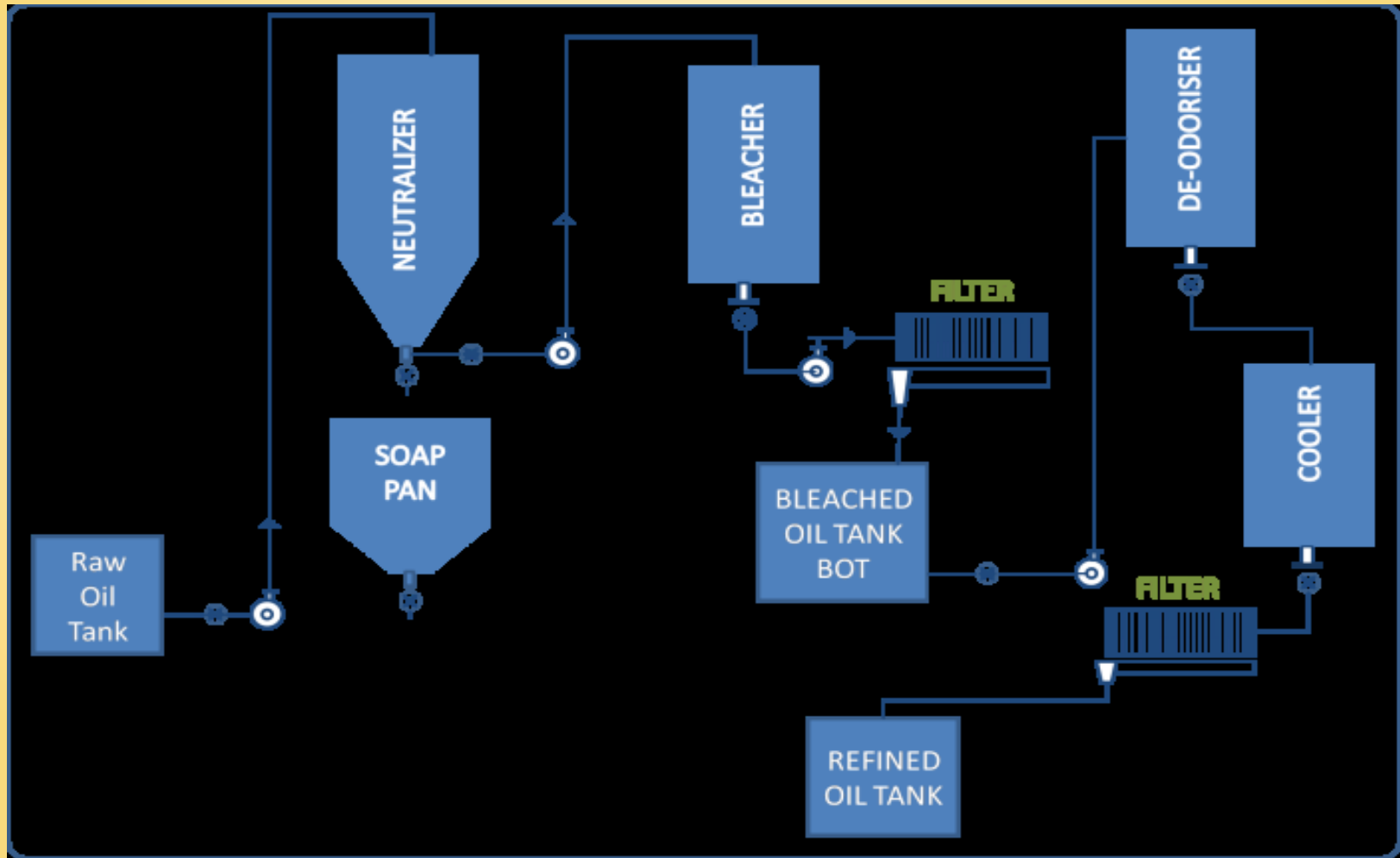
Oil Composition

	Omega 3%	Omega 6%	Omega 9%	Smoke Point	Vit E RDA per tbsp	
Camelina	35%	18%	16%	475F	101%	
Olive	2%	8%	76%	350F	8%	
Canola	7%	30%	54%	425F	10%	
Flax	58%	14%	19%	250F	15%	
Grape	0%	71%	17%	485F	trace	
Sunflower	0%	65%	23%	460F	28%	
Safflower	0%	75%	13%	510F	25%	
Coconut (a)	0%	3%	6%	350F	trace	
Peanut	0%	29%	47%	450F	14%	

FDA Approval

- In 2009, the FDA approved the use of camelina meal for a feedstock for the following rations
 - Poultry layer rations up to 10%
 - Broiler feed rations up to 10%
 - Beef cattle rations up to 10%
 - Swine feed rations up to 2%
- Typical meal analysis:
 - Crude Protein...42%
 - Crude Fat.....13%
 - Moisture.....8%
 - Fiber.....10%
 - Ash.....5.5%

Refined Oil Process



Refining Process Removes

- ▶ Fiber
- ▶ Proteins
- ▶ Chlorophyll
- ▶ Minerals-calcium, magnesium, iron
- ▶ Vitamins-removal of Vitamin E

Refined Oil Results

- ▶ Vitamin and mineral deficient
- ▶ Nutrient deficient
- ▶ Oils tend to be tasteless because of process

- ▶ Commercial Oil Process equivalent of:
 - White refined flour
 - White refined sugar

Unrefined Oil Process

1. Seed Press
2. Centrifuge
3. Bottle

