SARE Economic Analysis

**Seed to exhaust**

Scenario/assumptions:

* 4 crusher capacity
  + Capable of 20lbs of seed per hour, each
  + Crushing efficiency is 27% oil, 73 % meal per pound of seed
* Crushers costs $0.18/hour to operate
* 1 salaried employee at $30,000 per year
* 120 crushing hours per week
* SVO Fuel is processed at 15 gallons per hour
* $0.14 / hour -SVO fuel processing costs using WVO designs centrifuge
* Electrical rate is $0.11 per kwH
* Safflower seed costs $0.26 per lb
* 35 lb carboys, with shipping, costs $4.25 per carboy ($2.87 for carboy, $1.38 per carboy for shipping)
* Transportation capacity = 3,100 lbs
  + Fuel costs = $3.75/gallon
  + Mileage costs=$0.55/ mile
  + Fuel economy=17 miles per gallon
* 75% of oil delivered is returned as waste vegetable oil (wvo)
  + For every 1 lb of oil delivered, only .75 lbs return
  + For a 3,100 lb delivery of fresh oil, 2,325 lbs of wvo are returned for use as fuel

*Production and sale of safflower oil*

*Income*

**$1.50 / 1 lb of oil**

**$0.10 / 1 lb of safflower oilseed meal or $0.27 for every 1 lb of oil created**

**Therefore, 1 lb oil produces $1.50 + $0.27 = $1.77 for every 1 lb of oil sold**

*Expenses*

1. Feedstock: Fixed Cost

1 lb of oil / 0.27 = 3.7 lbs of seed x $0.26 / lb = **$0.96 per lb of oil**

1. Packaging: Fixed Cost

$4.25 / 35 lbs of oil per carboy = **$0.12 per lb of oil**

1. Electricity: Fixed Cost

($0.18 / kwH) / (20 lbs seed / hour per crusher) = ($0.009 / 1 lb of seed) x (3.7 lbs seed / 1 lb of oil) = **$0.03 / 1 lb of oil**

1. Transportation: Sliding cost

(250 miles one way trip) / (17 miles / gallon) = ~15 gallons x ($3.75/gallon) = $56.25

250 miles one way trip x ($0.55 / mile) = $137.50

$137.50 + $56.25 = $193.75 / (3,100 lbs of oil)= **$0.06 / 1 lb of oil**

1. Salary: Sliding costs

(120 crushing hours / week) x (20 lbs / hour) x (4 crushers)= 9600 lbs per week x (50 weeks / year)= 480,000 lbs of seed per year x 27% = 129,600 lbs of oil

($30,000 salary / year ) / (129,600 lbs oil / year) = **$0.23 / 1 lb of oil**

**Expense Total = $1.39 / 1 lb of oil**

**Net Income = ($1.77 income / 1 lb of oil) – ($1.40 expense / 1 lb of oil) = $0.37/ 1 lb of oil sold)**

*Production and sale of fuel*

*Income*

Income from sale of svo or biodiesel fuel negotiated with farmer who supplied oilseed

*Expenses*

1. Transportation: Sliding cost

(250 miles one way trip) / (17 miles / gallon) = ~15 gallons x ($3.75/gallon) = $56.25

250 miles one way trip x ($0.55 / mile) = $137.50

$137.50 + $56.25 = $193.75 / (2,325 lbs of oil)= **$0.08 / 1 lb of wvo returned**

1. Processing: Fixed cost

($0.14 / hour) / (15 gallons / hour) = ($0.01 / gallon) / (7.6 lbs oil /gallon) = <$0.01 / 1 gallon =negligible

**Expense total= ($0.08 / 1 lb of wvo refined into svo) x (7.6 lbs of oil / gallon) = $0.61 / gallon for svo**

**For biodiesel, add $1.56/gallon processing. Total expense for biodiesel production would be $2.17 / gallon**