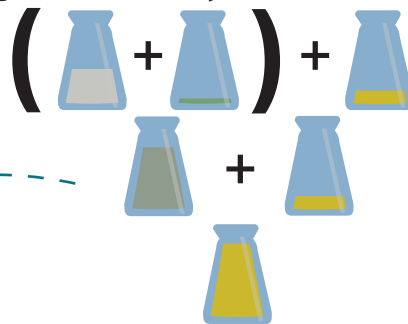


# High FFA Acid Catalysis

**1** Measure FFA Level.



**2** Add 2.25g methanol & 0.05g sulfuric acid for each gram of free fatty acid in the oil or fat.

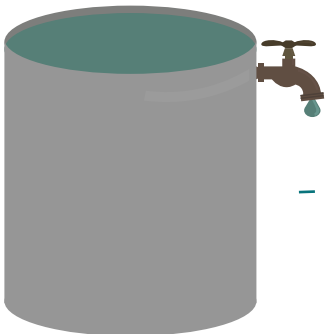


**3** Agitate for one hour at 60-65°C.



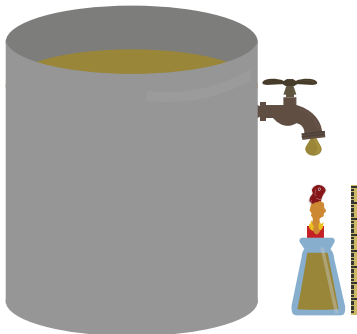
**4**

Let the mixture settle. Methanol-water mixture will rise to top. Decant the methanol, water and sulfuric acid layer.



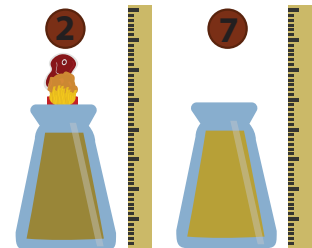
**5**

Take bottom fraction and measure the new FFA level.

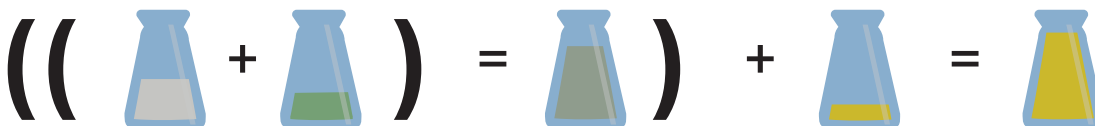


**6**

If FFA > 0.5%, go to step 2 with the new FFA level. If FFA > 0.5%, go to Step 7.



**7** Add an amount of methanol equal to  $0.217 \times [\text{grams of unreacted triglycerides}]$  and an amount of sodium methoxide equal to  $[0.25 + (\%FFA)0.190] / 100 \times [\text{grams of unreacted triglycerides}]$ . Mix the sodium methoxide with the methanol and then add to the oil. This corresponds to a 6:1 molar ratio of methanol to oil for the unreacted triglycerides.



**8** Agitate for one hour at 60-65°C.

