

# The Outlook and Impact of Biodiesel on the Oilseeds Sector

John C. Baize

USDA Outlook Conference

# Biodiesel Basics

- The basic ingredients of biodiesel are a refined fat or oil (~87%), methanol (~12%), and a catalyst (1%).
- About 7.5 pounds of oil/fat are required for each gallon of biodiesel produced
- Process creates biodiesel (86%), glycerin (8%), alcohol (4%) and fertilizer (1%).

# U.S. Diesel Consumption

- In 2004 the U.S. consumed 62.3 billion gallons of diesel.
- Of that amount 48.6 billion gallons were used for transportation purposes
- Agriculture used 3.2 billion gallons or 5.1% of total diesel supplies in 2004.
- On-highway usage was 37.1 billion gallons

# Soyoil Will Be Most Important Biodiesel Feedstock in U.S.

- Of the 53 biodiesel facilities in the U.S. today 34 use only soyoil as a feedstock
- 11 plants use multiple feedstocks
- 4 plants use recycled cooking oils and fats
- 1 uses beef tallow and 1 uses cottonseed oil
- Most new plants intend to use primarily soyoil as a feedstock
- Some southern coastal plants likely will use imported palm oil
- Soyoil accounts for about 75% of U.S. vegoil supplies

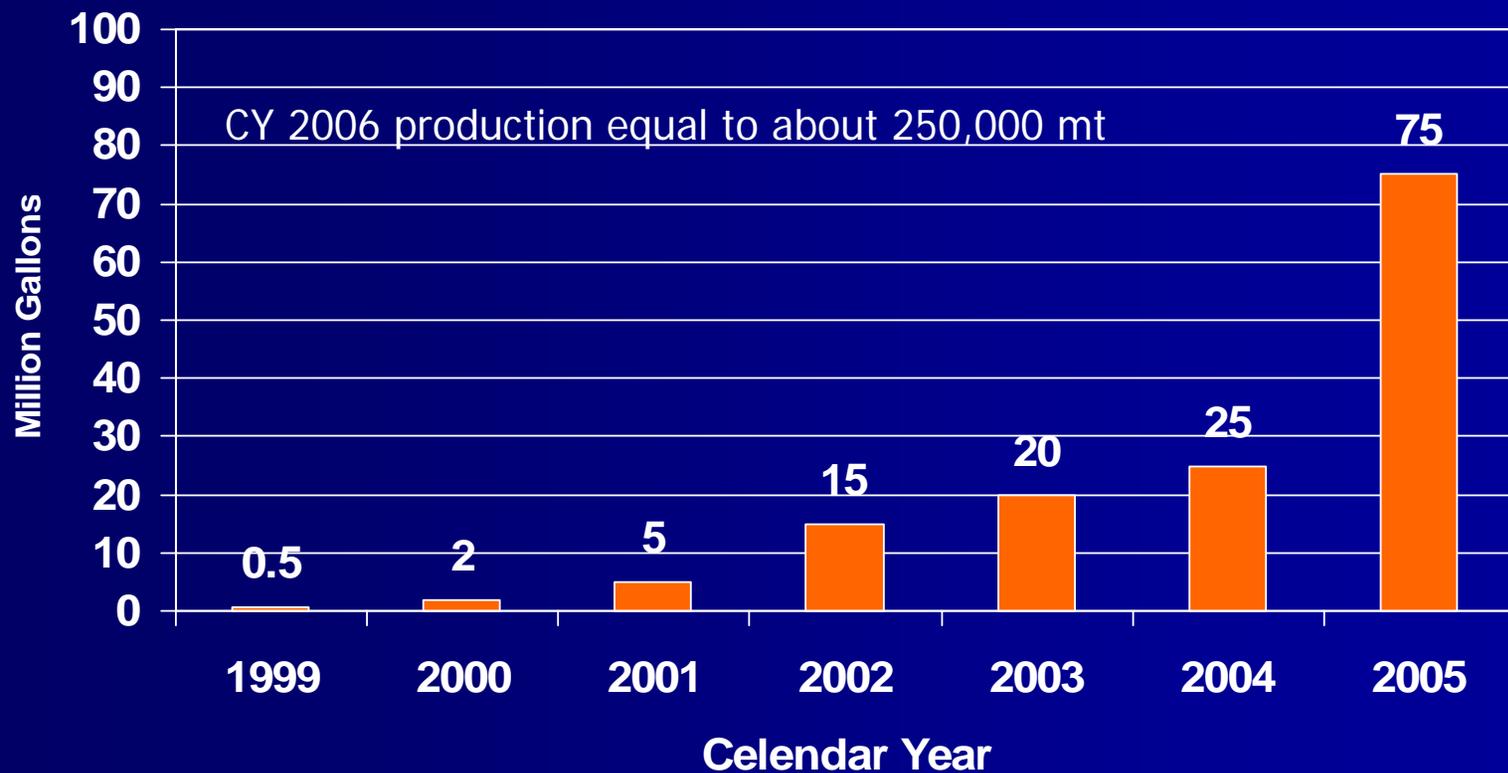
# U.S. Biodiesel Incentives

- Energy act of 2005 provides \$1/gallon federal tax incentive for biodiesel made from virgin vegetable oils (1¢ per %)
- Tax incentive for biodiesel made from animal fats and used vegetable oils is 50¢/gallon (0.5¢ per %)
- The tax incentive for using virgin vegetable oils to make biodiesel is about \$302/mt or 13.3¢/pound.
- This equates to about 56% of soy oil price or \$42/barrel.

# U.S. Biodiesel Industry

- 53 existing biodiesel facilities with annual capacity of 354 million gallons
- 4 plants being expanded with additional capacity of 31.5 million gallons
- 35 companies have announced plants to be built in 18 months that will add about 278 million gallons of annual capacity
- Total installed capacity by mid-2007 of 632 million gallons (2.09 mmt)
- Additional plants being announced

# Estimated U.S. Biodiesel Production



Source: National Biodiesel Board

# Future Impact of Biodiesel

- Each gallon of biodiesel requires about 7.5 pounds of vegoil
- It will take about 2.15 mmt (4.74 billion pounds) of oils/fats to run existing and announced biodiesel plants at full capacity each year in the U.S.
- That's equal to about 20% of U.S. vegoil use in 2004/05
- U.S. vegoil ending stocks totaled only 1.079 mmt at end of 2004/05

# U.S. Vegoil Exports and Imports

## U.S. Already a Net Vegoil Importer



# Realities of Soybean Processing

- It has been demand for soymeal that largely has driven the crush of soybeans in the U.S. in the past.
- Excess soyoil was stored until it was needed by the domestic or export market.
- If meal demand was weak the crush rate was reduced unless soyoil demand was strong and could sustain margins.
- The result was a drop in soymeal prices.

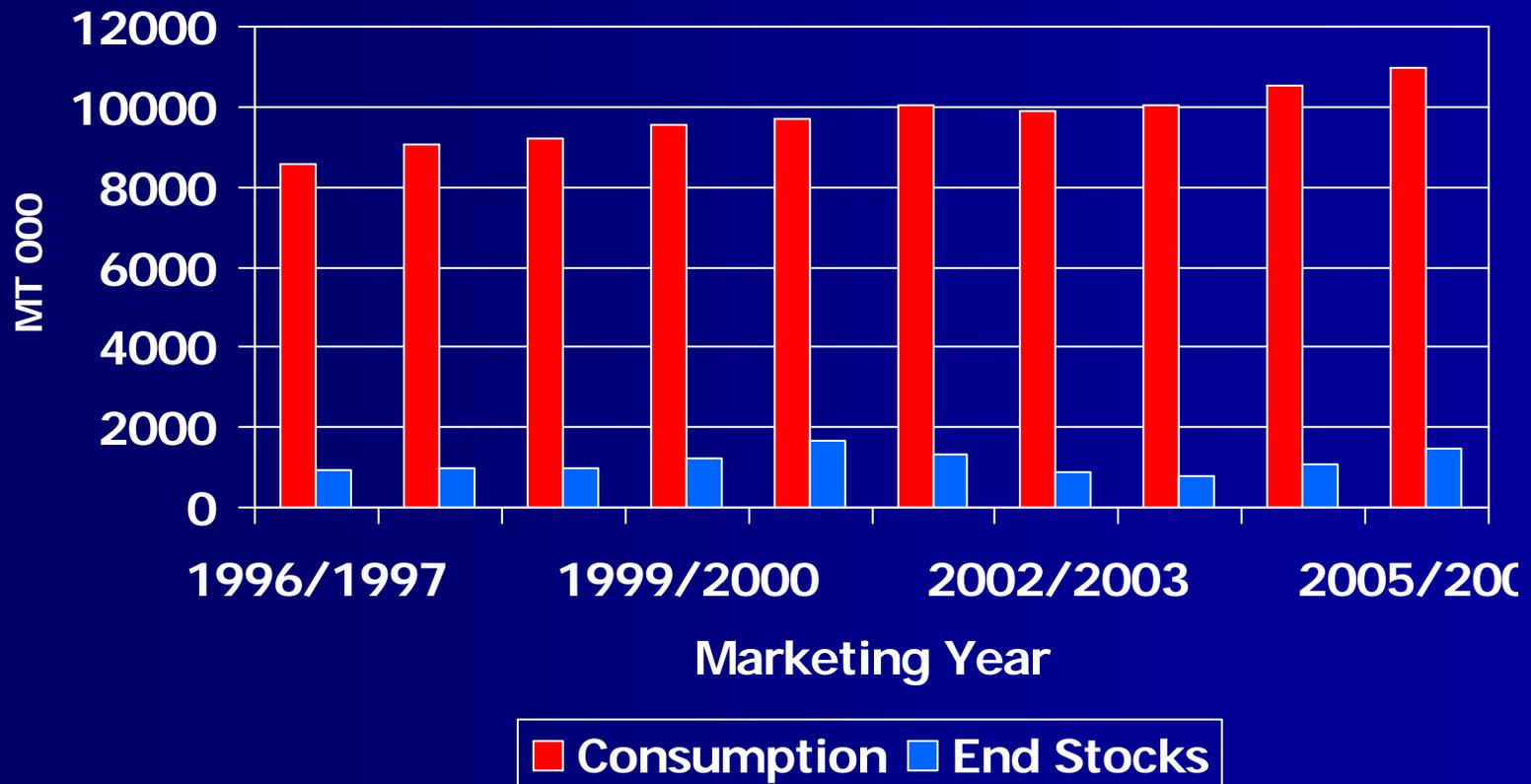
## Oil-Meal Balance in Soybean Crush

- Typically soyoil has contributed 30% – 40% of soybean crush product value.
- Each 1¢/pound increase in soyoil prices equal to ~\$4.20 increase in soyoil value from crushing metric ton of soybeans
- Soymeal price can drop by ~\$5.40/mt and maintain same crush margin (assuming no change in soybean price)

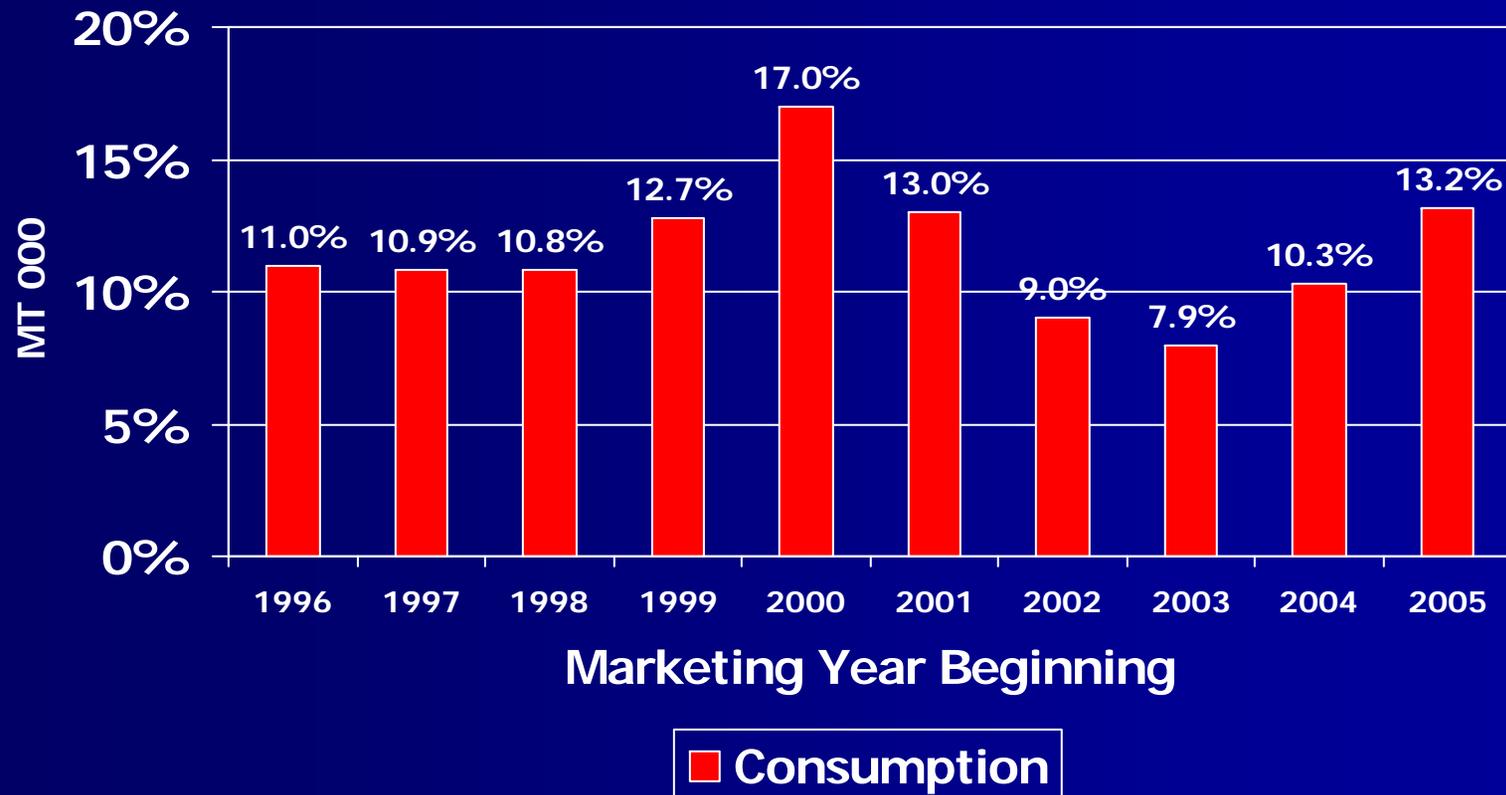
## If Biodiesel Increases Vegoil Prices

- Greater demand for vegoils to produce biodiesel is almost certain to drive vegoil prices higher and increase crusher return from oil
- This will increase crush margins and cause crushers to crush a greater volume assuming the decline in meal returns does not exceed additional gain from vegoil
- If soyoil prices rise because of biodiesel demand by 4¢/pound then margins will not fall (assuming no change in soybean prices) unless soymeal prices fall by more than \$21.60/mt

# U.S. Vegoil Consumption & End Stocks 1996/97 – 2005/06



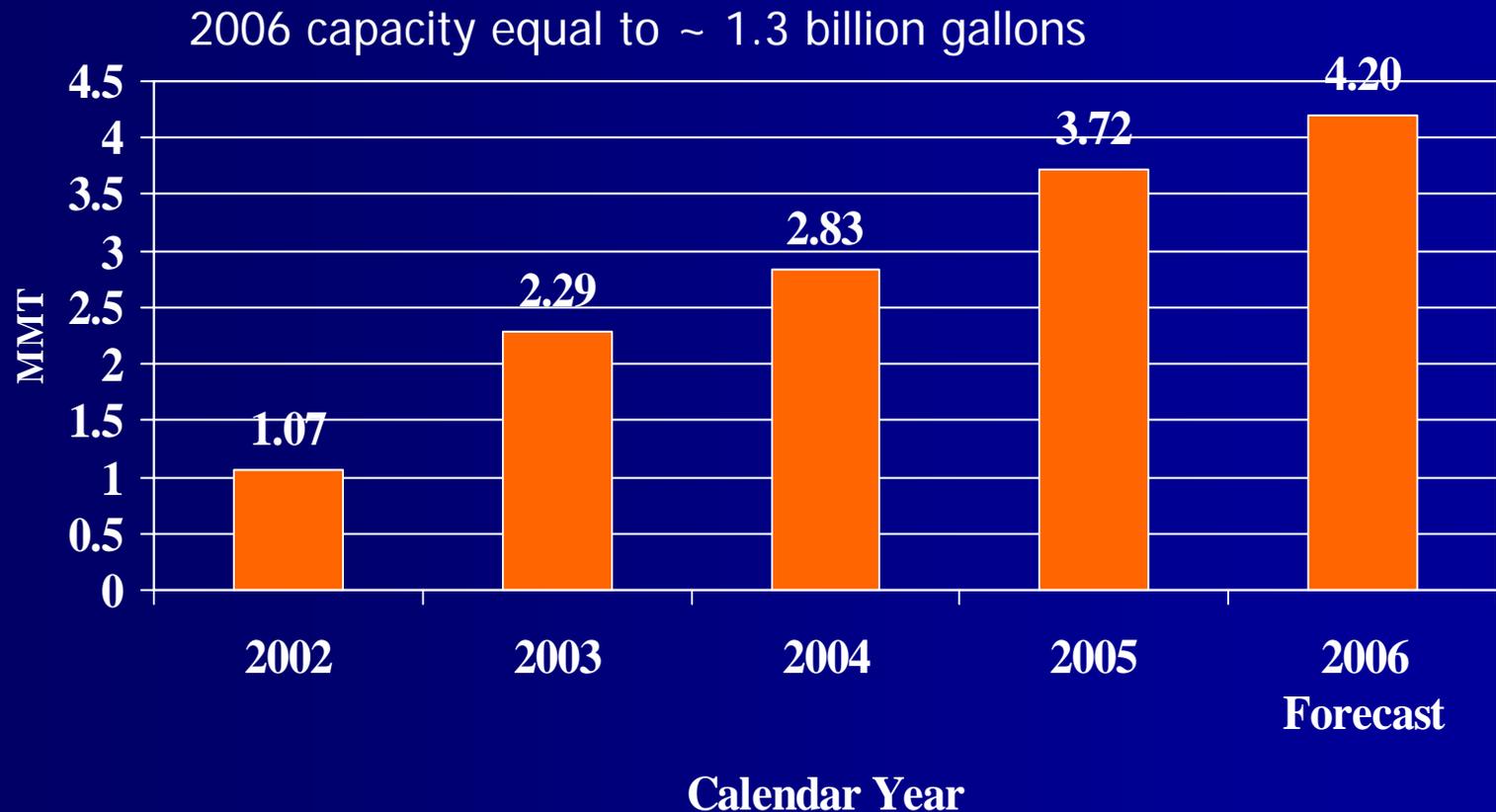
# U.S. Vegoil End Stocks To Use Ratio 1996/97 – 2005/06



# EU-25 Biofuels Program

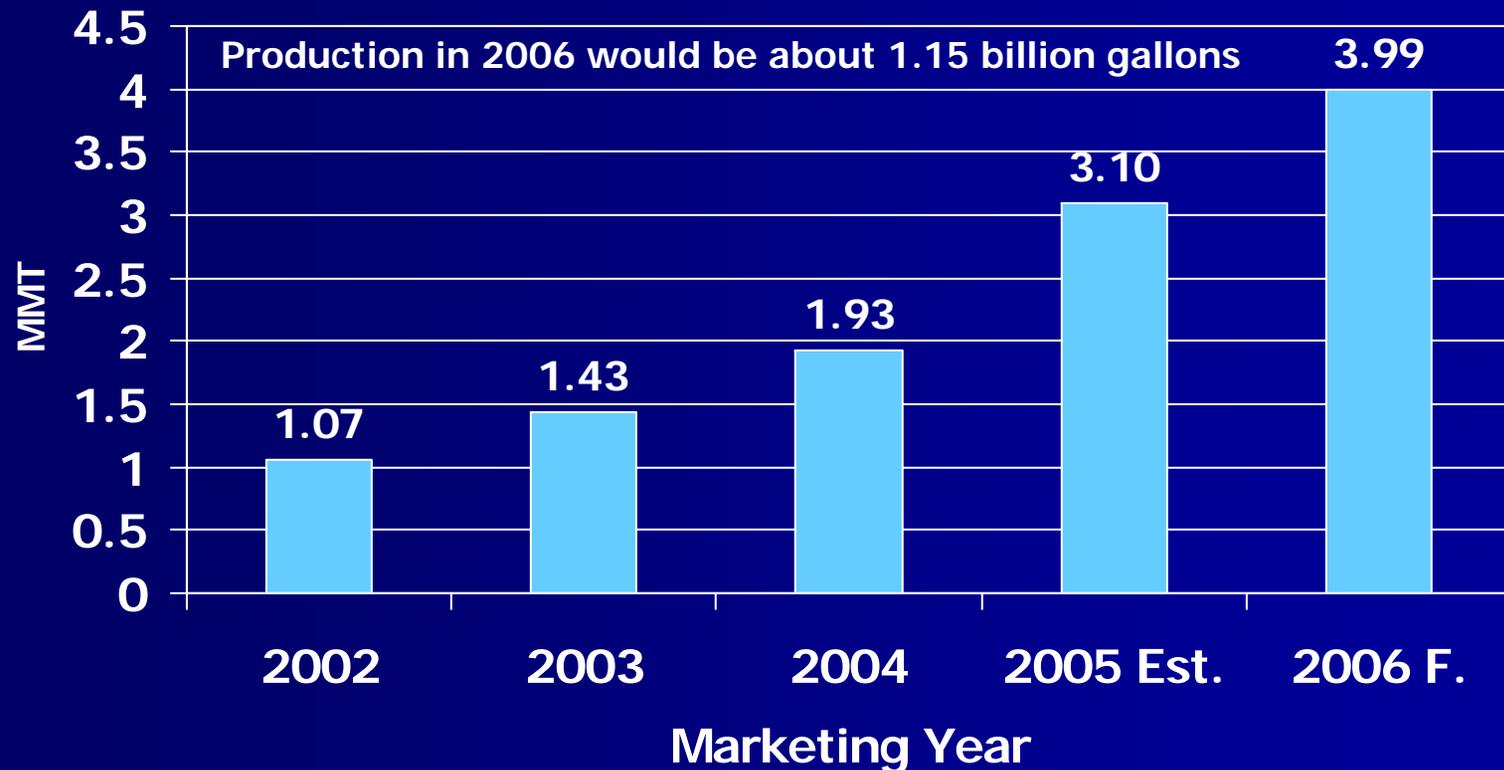
- EU policy is to replace 5.75% of all transportation fuels with biofuels by 2010.
- The EU used 162 mmt of diesel in 2004
- It will require 9.32 mmt of biodiesel and equivalent amount of oils/fats to reach biofuels goal
- Large tax incentives being offered in EU countries to stimulate biofuel production
- So far biodiesel is largest biofuel produced in Europe
- EU biodiesel regulations favor use of rapeseed oil rather than soyoil

# European Union Biodiesel Production Capacity



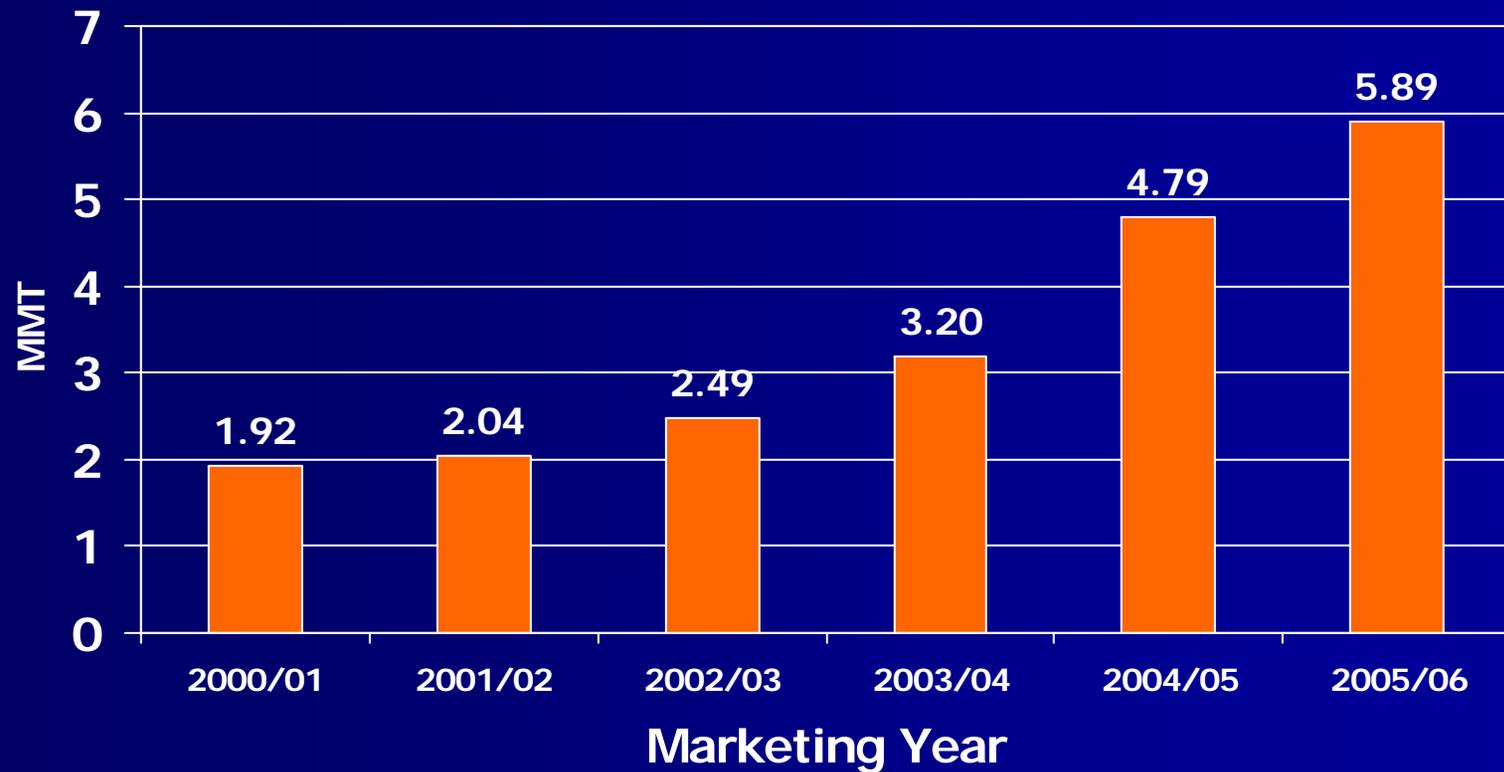
Source: *Oil World*

# EU-25 Biodiesel Production

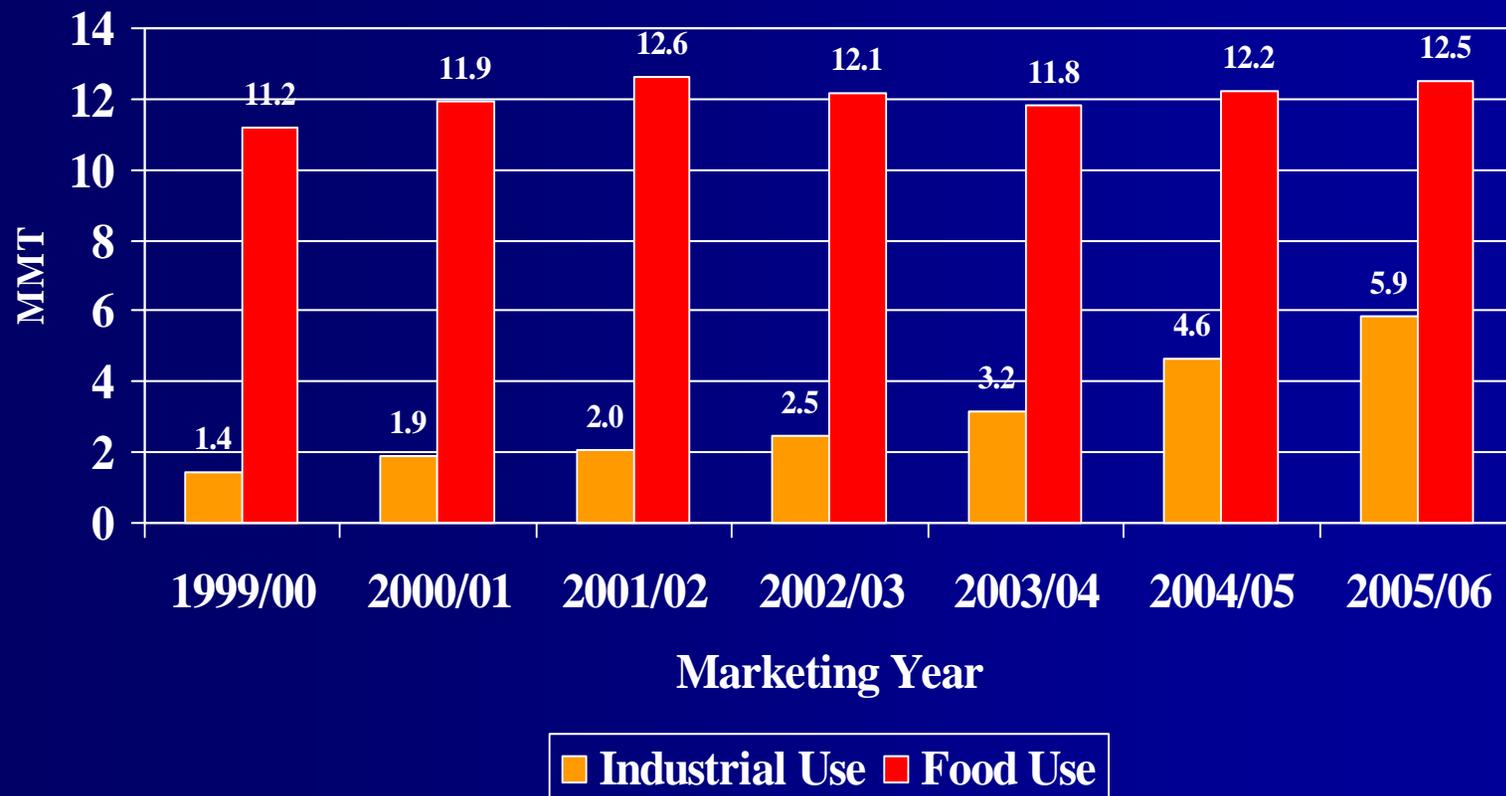


Source: European Biodiesel Board, *Oil World*

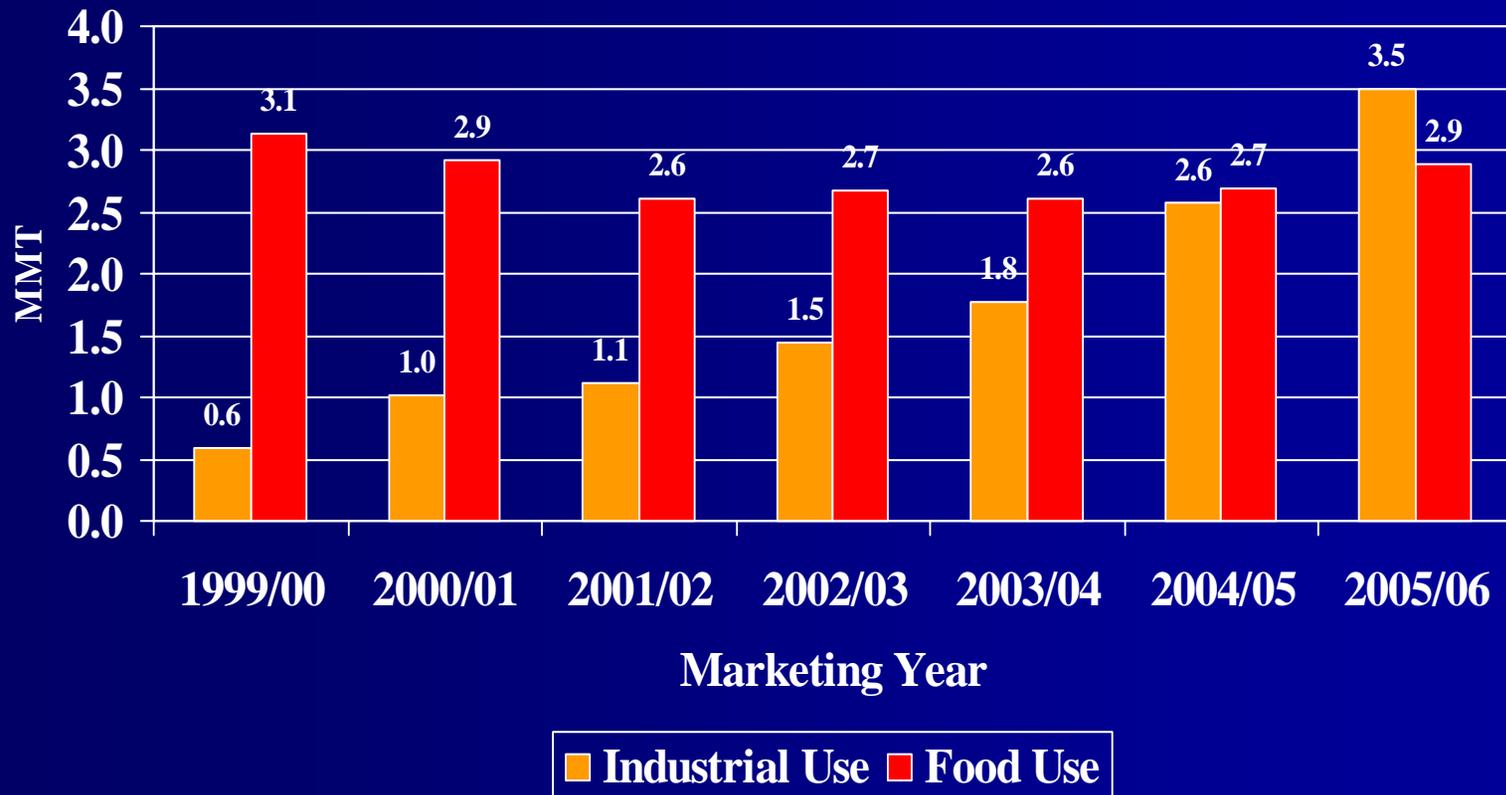
# European Union Industrial Use of Vegoils



# European Union Industrial and Food Use of Vegetable Oils 199/00 – 2004/05

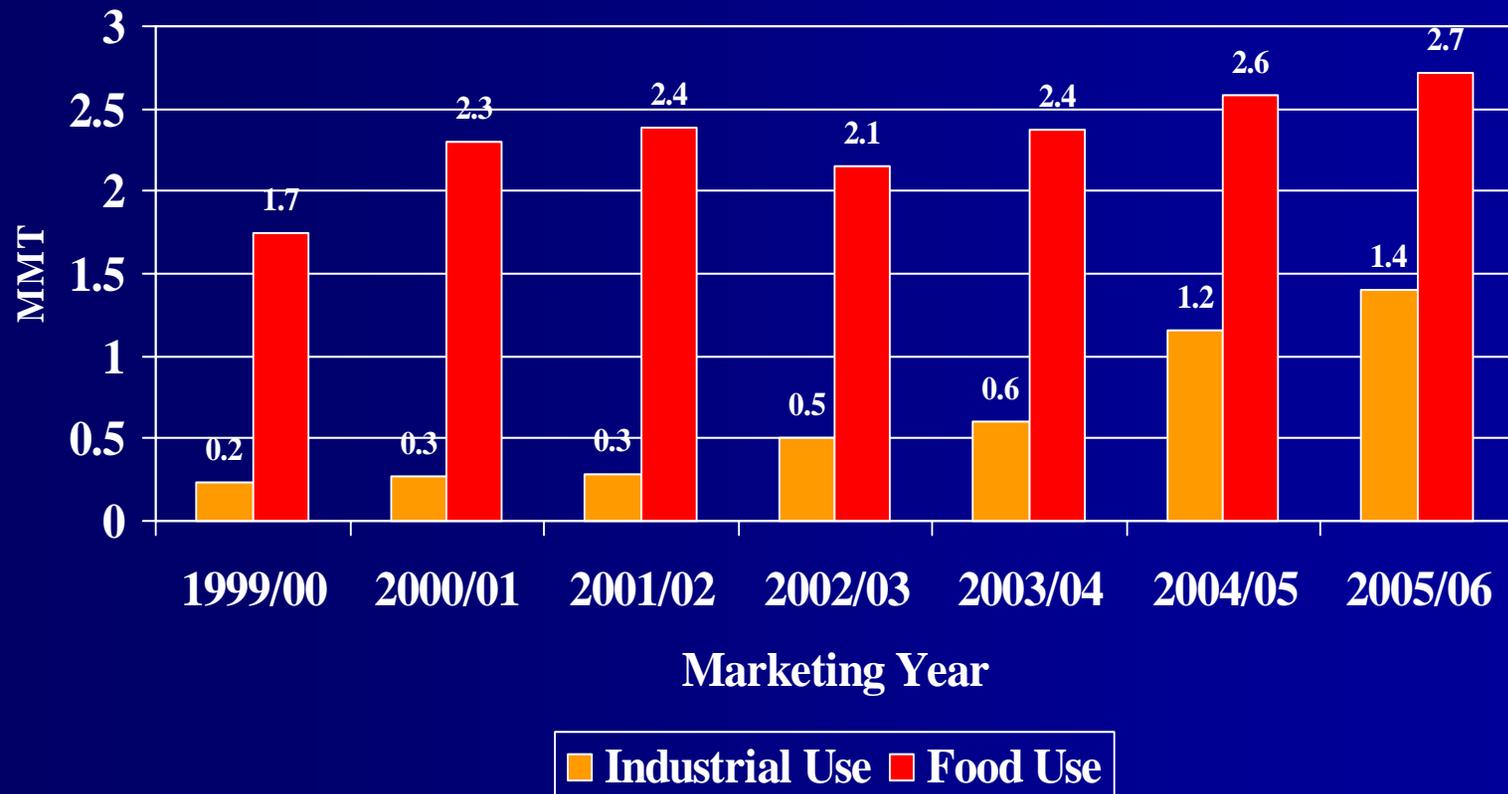


# European Union Industrial and Food Use of Rapeseed Oil 1999/00 – 2005/06



Source: USDA, *Oil World*

# European Union Industrial and Food Use of Palm Oil 1999/00 – 2004/05 and Forecast for 2005/06



# The Coming Protein Glut

- Each bushel of corn run through a dry mill ethanol plant produces about 17 pounds of distillers dried grains (DDG) with a protein content of about 27% and moisture level of 12%.
- That's 7.7 mmt of DDG per billion bushels of corn used to produce ethanol. About 1.6 billion bushels. of corn to be used to make ethanol in US in 2005/06
- The DDG must find a home in the market and will price itself into animal feeds or other uses
- Most DDG is used for cattle and dairy rations, but increasing amounts are being used in swine and poultry feeds.
- Each ton of DDG used in a swine or poultry ration instead of corn displaces the need for about 0.4 tons of soymeal on a protein equivalent basis.

## The Coming Protein Glut (Cont.)

- Soymeal and other protein oilseed meals will have to compete in domestic market with DDG.
- This is likely to result in lower oilseed meal prices and possible decline in domestic soymeal consumption.
- Biodiesel demand is likely to result in higher vegoil prices and incentives to crush at higher rate. This will create more soymeal and other oilseed meals which will further depress prices.
- At some point US soymeal will become more competitive in global markets
- **U.S. could once again become major soymeal exporter to the detriment of processors in South America.**

# U.S. Soybean Meal Exports 1996/97 – 2005/06



# U.S. Soymeal Consumption 1996/97 – 2005/06

Relatively Little Growth



# Global Vegoil End Stocks To Use Ratio 1996/97 – 2005/06



## Biodiesel To Stimulate Production of Some Vegoils More Than Others

- Palm oil yields in Malaysia about 3.9 mt/ha.
- Canola oil yield in Europe yields about 1.34 MT/ha.
- Soyoil yield in U.S. is about 0.55 mt/ha.
- Sunoil yield in Ukraine is about 0.42 mt/ha.

# The Food Versus Fuel Debate of the Future – A Moral Dilemma

- A truck averaging 7 miles/gallon and using fuel with 20% biodiesel content would use 86 gallons of biodiesel on a cross country trip.
- It would take about 645 pounds of vegoil to make that much biodiesel or the equivalent of the oil over 25 people will consume in India in a year.
- It would take about 8.3 mmt of vegoil to supply 5% of U.S. annual transportation-related diesel consumption. That's about 68% of India's total vegoil consumption or about 80% of annual U.S. vegoil consumption.
- If there is a global vegoil shortage, who will win out? Drivers in developed countries? Or poor consumers in developing countries?

# Thank You!

John C. Baize  
John C. Baize and Associates  
Tel: 703-698-5908  
Email: [Jbaize@attglobal.net](mailto:Jbaize@attglobal.net)