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Monthly Biodiesel Production Report

June 2009

U.S. Energy Information Administration
Office of Coal, Nuclear, Electric and Alternate Fuels
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Preface

The Monthly Biodiesel Production Report is intended to provide insight into the operations of the U.S. biodiesel industry. The audience for this report is the U.S. Department of Energy, other governmental entities, industry trade groups, the private sector, and the general public. The U.S. Energy Information Administration (EIA) intends to provide a statistically reliable, comprehensive, and publicly accessible source of annual and monthly data. Prior to the establishment of the Monthly Biodiesel Production Report, there was no comprehensive source of statistical data to monitor the size or direction of growth in the biodiesel industry. This report is part of EIA's response to Section 1508 of the Energy Policy Act of 2005, which directs EIA to publish information on renewable fuels including biodiesel.

EIA obtains the data presented in this report from two surveys, the Monthly Biodiesel Production Survey (Form EIA-22M) and the Supplement to the Monthly Biodiesel Production Survey (Form EIA-22S). Form EIA-22M collects the following data from registered U.S. producers of biodiesel by plant:

- Plant location, operating status, and annual production capacity
- B100 and coproduct production and monthly stock changes
- Feedstock, alcohol input, and other catalysts into biodiesel production
- Sales of B100 and blended biodiesel
- End-use sales of biodiesel

Form EIA-22M is designed to provide the data necessary for EIA to carry out its responsibilities regarding renewable fuels demand in the motor fuels market, to monitor the rate of growth of the biodiesel industry, and to inform Congress whether the objectives of Section 503 of the Energy Policy Act of 1992 and Section 1508 of Energy Policy Act of 2005 are being achieved.

EIA-22M is unique in its frequency and depth. The National Biodiesel Board, for example, presents an annual production estimate. EIA has also used data from Census Report M311K Fats and Oils: Production, Consumption, and Stocks, which tracks monthly disposition of vegetable oils and animal fats. One of the uses monitored by the Census report is the input of oil and fats to methyl ester production, which is assumed to be marketed as biodiesel. EIA-22M explicitly tracks the production of biodiesel and adds data on alcohol and catalyst inputs, glycerol output, and estimated producer prices for a variety of sales types. EIA-22M enables regional and State-level reporting of biodiesel activities.

Form EIA-22S is a one-time supplement to the Monthly Biodiesel Production Survey. It collected annual observations of production capacity, biodiesel production, and coproduct production for comparison with other sources to ensure data quality. In this report, preliminary annual data are presented for 2008, and preliminary monthly data are presented for 2009.

Future Publications of the *Monthly Biodiesel Production Report*

The data presented in this report are approximately 12 months old. The EIA-22M survey was first opened in June 2009 for January 2009 data. There are several reasons for the lag between the opening of the survey and the first publication. One is that EIA-22M is a new survey. It is aimed at respondents who, for the most part, have never submitted an EIA survey prior to EIA-22M. Many respondents, therefore, needed online assistance or answers to technical questions as they worked through their survey for submission. Another reason for the delay is the timing of the survey launch. Market conditions were poor for biodiesel producers in early 2009. Many firms were not actively producing or marketing biodiesel and logically assumed that a response to EIA-22M was not required. Some firms may also have laid off staff during the inactivity, and the remaining employees may have experienced difficulty collecting the information needed for the survey. Our survey staff spent considerable time following up with nonrespondents in the months after the survey was launched. The complexity of EIA-22M was also an issue for survey respondents. Though EIA worked with the National Biodiesel Board to inform respondents about the content of the survey, there are many raw materials that can be used to produce biodiesel, and there are several ways that the product can be marketed. A detailed form is needed to develop a high-resolution snapshot of market conditions in each month, and it is understandable that respondents would have questions the first few times through the survey.

EIA intends to accelerate publishing the remaining data for 2009 and 2010. Data for the third quarter of 2009 are expected to be released in July 2010, and data for the fourth quarter of 2009 are expected to be released in September 2010. EIA anticipates routine publication of the monthly report approximately 75 days after the end of a calendar month.

Table of Contents

Market Summary	1
Table 1. Biodiesel Production Capacity and Production, 2008 through June 2009	3
Table 2. Activity at Biodiesel Plants, January through June 2009	4
Table 3. Inputs to Biodiesel Production, January through June 2009	5
Table 3. Inputs to Biodiesel Production, January through June 2009 (Continued)	6
Table 4. Biodiesel and Glycerol Production, by State, June 2009.....	7
Table 5. Biodiesel and Glycerol Production, by Census Division, June 2009	8
Table 6. Biodiesel and Glycerol Production, by Petroleum Administration For Defense District, June 2009	9
Table 7. Biodiesel Producers Sales for Resale, by Blend, January through June 2009.....	10
Table 8. Biodiesel Producer Sales, by Blend and Assignment of Tax Credit, January through June 2009	11
Table 9. Biodiesel Producer Revenue, by Blend and Assignment of Tax Credit, January through June 2009	12
Table 10. Average Price Received by Biodiesel Producers, by Blend and Assignment of Tax Credit, January through June 2009	13
Table 11. Energy Balance of Biodiesel Production, 2008 through June 2009	14

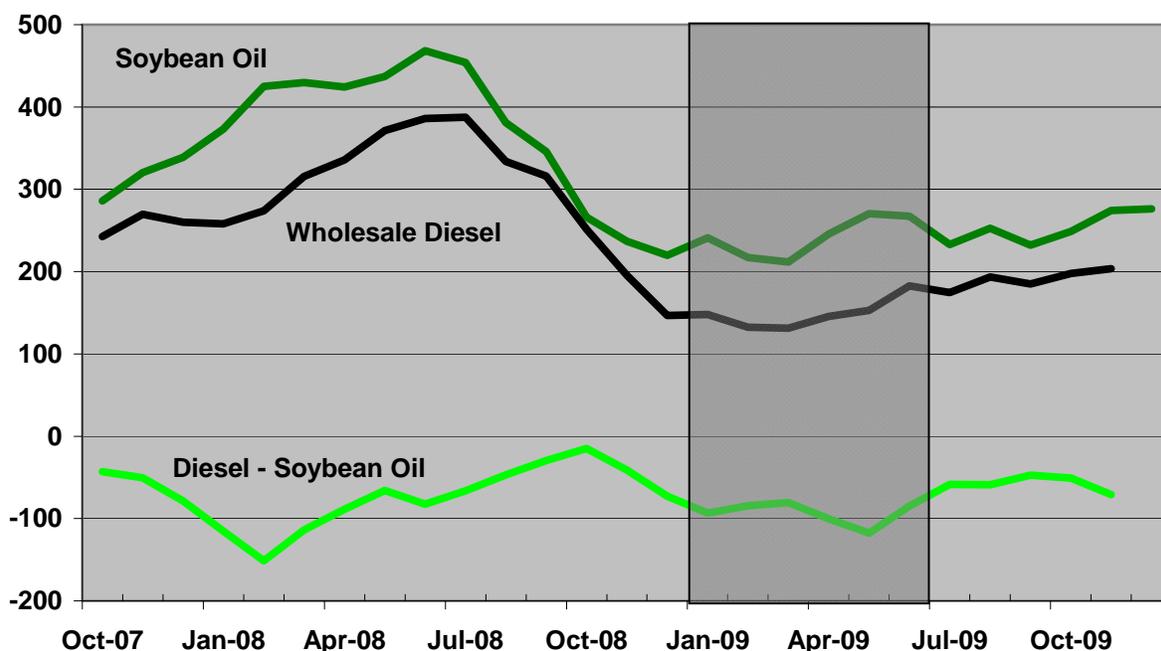
Market Summary

As of June 2009, the United States had 151 active biodiesel producers with total production capacity of 2.1 billion gallons per year. Actual production for all of 2008 was 678 million gallons. Production for the first 6 months of 2009, however, was 188 million gallons, equivalent to 376 million gallons per year. Capacity utilization was 23 percent in January 2009 and was 18 percent in June 2009 (Table 1). Biodiesel typically sold at a premium to petroleum diesel during this period. The average price of blends containing 98 percent or more biodiesel and sold net of the Federal tax credit was \$1.72 per gallon for the first 6 months of 2009 (Table 10). The average diesel wholesale price during this period was \$1.49 per gallon.

New to this report is a table of inputs to biodiesel production (Table 3). The largest feedstock input for the first 6 months of 2009 was soybean oil. Soybean oil use for biodiesel production was 709 million pounds, or 12 trillion Btu, half of all feedstock used (Table 11). Beef tallow, totaling 263 million pounds between January and June 2009, was the second-largest feedstock. White grease, a pork byproduct, was the third-largest, at 113 million pounds over the first 6 months of 2009.

Figure ES-1 shows soybean oil prices, wholesale diesel prices, and the spread between the two from October 2007 through December 2009. The darker gray area shows January 2009 through June 2009.

Figure ES-1. Soybean Oil and Diesel Prices (cents per gallon)



Sources: U.S. Energy Information Administration, *Petroleum Marketing Monthly*, March 2010, Table 4 and U.S. Department of Agriculture, *Oil Crops Outlook*, Feb 11, 2009, and Feb 12, 2010, Table 9.

Note: Soybean oil less diesel is calculated as $0.991 \times \text{soybean oil price} - \text{diesel price}$, since 0.991 gallon of soybean oil is assumed to yield 1 gallon of biodiesel.

The spread between diesel and soybean oil prices, shown as the lowest line in Figure ES-1, is a key indicator of biodiesel producers' ability to compete with petroleum diesel fuel while still covering their costs. There are some fuel consumers who are willing to pay a price premium for biodiesel, but biodiesel

can probably only achieve widespread use above mandated levels if it can be sold at the same price or a lower price per gallon than petroleum diesel fuel. If the spread between diesel and soybean oil prices is negative, a subsidy or additional revenue stream is likely to be needed to make biodiesel production profitable. For the time period covered in this report, the combined value of the Federal Biodiesel Income Tax Credit and the Federal Biodiesel Mixture Excise Tax Credit was 100 cents per gallon, allowing for price parity between soybean oil and diesel fuel at the retail level as long as the spread between diesel and soybean oil prices was less than 100 cents per gallon. Biodiesel producers' ability to cover their other variable costs or realize a positive margin on their operations was increasingly compromised as the spread between soybean oil and diesel approached the value of the biodiesel tax credits. Glycerol, the major coproduct of biodiesel production, was once assumed to be an additional revenue stream. However, the growth in biodiesel production has glutted the market for glycerol in many places. It is not certain that a biodiesel producer can sell its glycerol; some may need to pay to dispose of it. Other potential subsidies during this time period were the Small Agri-Biodiesel Producer Tax Credit and various State tax credits for biodiesel producers. Unlike the Federal income and excise tax credits, these other subsidies were not universally applicable.

The economics of soybean-based biodiesel production worsened in the second quarter of 2009 relative to the first quarter of 2009. In the first quarter, the price of soybean oil exceeded the price of diesel fuel by an average of 86 cents per gallon. In the second quarter, the soybean oil price premium increased to an average of \$1.01 per gallon over diesel fuel. This is reflected in a reduction in the use of soybean oil for biodiesel production. Animal fat-based producers also reallocated their slate of raw materials between January and June 2009. Reductions in the use of tallow and poultry fat were largely mirrored by increased use of white grease, other animal fats, and yellow grease.

Table 1. Biodiesel Production Capacity and Production, 2008 through June 2009
(Million Gallons)

Period	Annual Production Capacity	B100 Production
2008	1,759	678
2009 ^R		
January	2,153	42
February	2,144	33
March	2,090	25
April	2,091	26
May	2,146	29
June	2,143	32
Year-to-Date	--	188

-- = Not applicable.

Notes: B100 is the industry designation for pure biodiesel; a biodiesel blend contains both pure biodiesel and petroleum diesel fuel. R=revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey" and EIA-22S, "Supplement to the Monthly Biodiesel Production Survey."

Table 2. Activity at Biodiesel Plants, January through June 2009
(Million Gallons)

Period	B100 Production	Sales of B100	Sales of B100 Included in Biodiesel Blends	Beginning-of-Month Stocks of B100	End-of-Month Stocks of B100	B100 Stock Change
2009^R						
January	42	14	21	28	35	7
February	33	18	20	35	31	-4
March	25	12	14	32	30	-1
April	26	13	15	30	30	s
May	29	18	18	30	23	-7
June	32	18	21	23	18	-5
Year-to-Date	188	92	109	--	--	--

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

-- = Not applicable.

Notes: B100 is the industry designation for pure biodiesel; a biodiesel blend contains both pure biodiesel and petroleum diesel fuel. Totals may not equal sum of components due to independent rounding. R= revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 3. Inputs to Biodiesel Production, January through June 2009
(Million Pounds)

Period	Feedstock Inputs							
	Vegetable Oils					Animal Fats		
	Canola Oil	Corn Oil	Cottonseed Oil	Palm Oil	Soybean Oil	Other Vegetable Oil	Poultry Fat	Tallow
2009								
January	44	W	-	W	153	W	16	71
February	15	W	-	W	146	s	15	42
March	W	W	-	W	102	1	7	35
April	W	4	-	W	102	s	8	28
May	2	8	-	W	94	W	10	47
June	2	4	-	W	111	W	10	40
Year-to-Date	W	21	-	W	709	W	66	263

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

W = Withheld to avoid disclosure of individual company data.

- = No data reported.

Note: Other Vegetable Oil includes castor, coconut, peanut, sunflower, tung, and other vegetable oils.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey"

Table 3. Inputs to Biodiesel Production, January through June 2009 (Continued)
(Million Pounds)

Period	Feedstock Inputs					Other Inputs		
	Animal Fats		Recycled Feedstock		Algae	Other Feedstock	Alcohol	Catalysts
	White Grease	Other Animal Fats ¹	Yellow Grease	Other Recycled Feedstock ²				
2009								
January	13	1	4	W	-	-	29	5
February	10	W	4	W	-	-	25	4
March	18	W	5	s	-	-	19	3
April	25	1	12	W	-	-	18	3
May	20	W	13	s	-	W	19	3
June	28	19	11	W	-	W	22	4
Year-to-Date	113	26	50	2	-	W	132	22

¹ Includes lard, etc.

² Includes brown grease, etc.

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- = No data reported.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey"

Table 4. Biodiesel and Glycerol Production, by State, June 2009
(Million Gallons)

State	Number of Producers	Annual Production Capacity	Production	
			B100	Glycerol
Alabama	4	32	-	-
Arizona	3	18	W	W
Arkansas	3	78	W	W
California	11	71	W	W
Colorado	1	-	-	-
Connecticut	1	2	W	W
Florida	2	-	-	-
Georgia	7	39	W	W
Hawaii	1	-	-	-
Illinois	6	218	W	W
Indiana	6	120	W	W
Iowa	10	253	3	W
Kansas	1	2	-	-
Kentucky	4	54	W	W
Louisiana	1	12	-	-
Maryland	2	3	-	-
Michigan	3	32	-	-
Minnesota	5	107	W	W
Mississippi	4	88	-	-
Missouri	6	104	4	1
Montana	1	s	-	-
Nebraska	1	5	W	W
Nevada	1	1	W	W
New Jersey	1	-	-	-
New Mexico	1	1	-	-
New York	1	10	-	-
North Carolina	7	8	s	s
Ohio	6	66	W	-
Oklahoma	2	60	W	W
Oregon	1	-	-	-
Pennsylvania	5	52	W	W
Rhode Island	2	s	W	W
South Carolina	2	55	-	-
South Dakota	1	2	-	-
Tennessee	6	52	-	-
Texas	19	448	W	W
Utah	1	-	-	-
Virginia	3	14	s	W
Washington	4	105	-	-
West Virginia	1	3	W	W
Wisconsin	4	32	W	W
U.S. Total	151	2,143	32	4

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W = Withheld to avoid disclosure of individual company data.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. Number of Producers is a count of entities with operable capacity in the reporting month.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 5. Biodiesel and Glycerol Production, by Census Division, June 2009
(Million Gallons)

Census Division	Number of Producers	Annual Production Capacity	Production	
			B100	Glycerol
New England	3	2	W	W
Middle Atlantic	7	62	W	W
East North Central	25	468	W	1
West North Central	24	473	11	2
South Atlantic	24	121	W	W
East South Central	18	225	W	W
West South Central	25	597	W	W
Mountain	8	20	s	W
Pacific	17	176	W	W
U.S. Total	151	2,143	32	4

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W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components due to independent rounding. Number of Producers is a count of entities with operable capacity in the reporting month.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

FIGURE 1. U.S. CENSUS REGIONS AND DIVISIONS

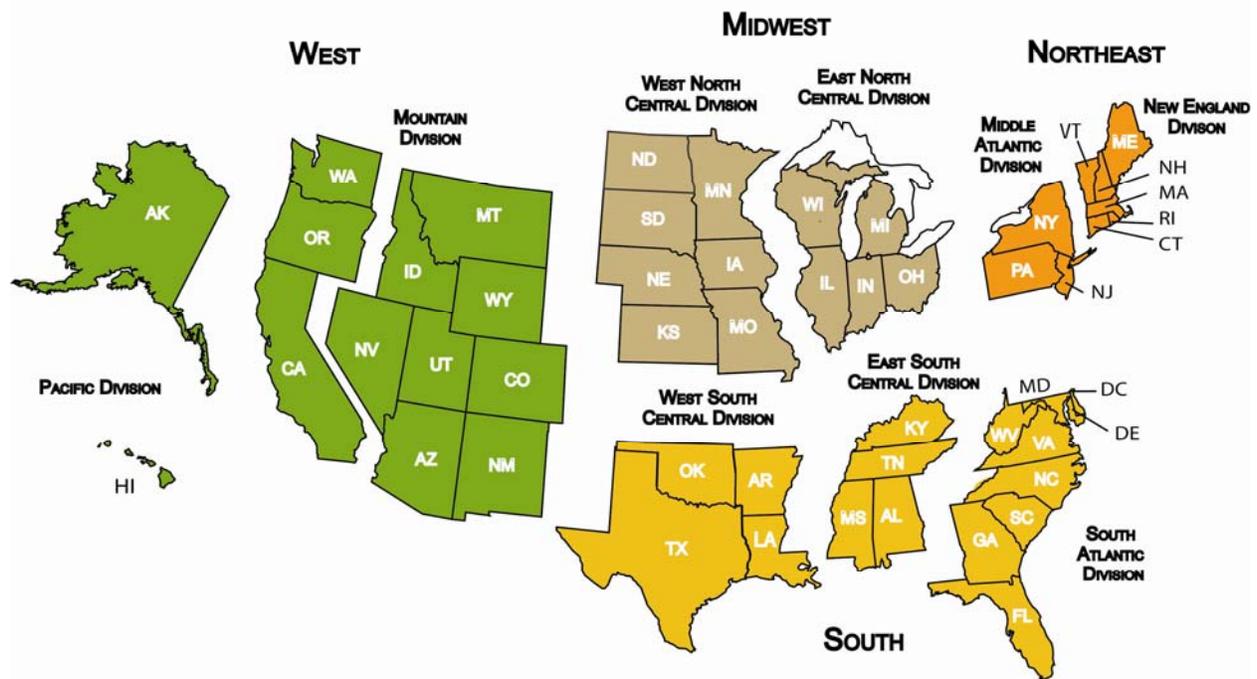


Table 6. Biodiesel and Glycerol Production, by Petroleum Administration for Defense District, June 2009
(Million Gallons)

Petroleum Administration for Defense District	Number of Producers	Annual Production Capacity	Production	
			B100	Glycerol
I	34	185	3	s
II	61	1,106	21	3
III	32	657	6	s
IV	3	s	-	-
V	21	194	1	s
U.S. Total	151	2,143	32	4

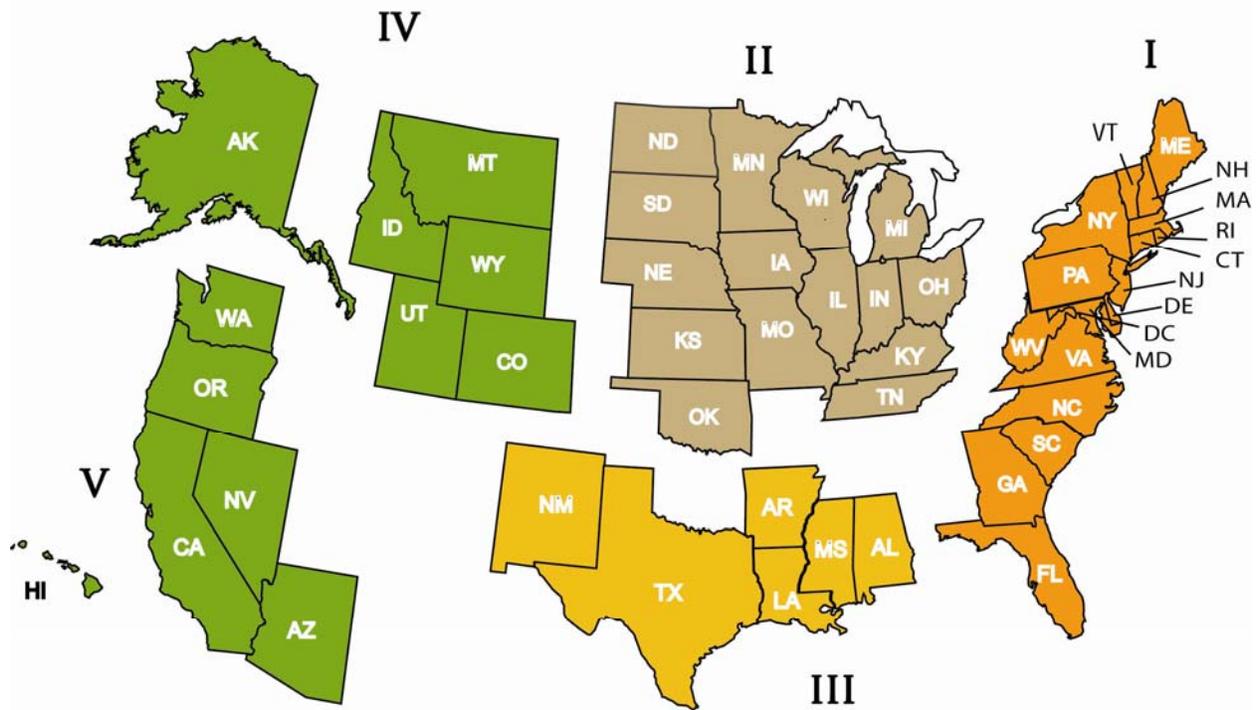
s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. Number of Producers is a count of entities with operable capacity in the reporting month.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

FIGURE 2. PETROLEUM ADMINISTRATION FOR DEFENSE (PAD) DISTRICTS



NOTE: MAP NOT TO SCALE.

Table 7. Biodiesel Producers Sales for Resale, by Blend, January through June 2009
(Million Gallons)

Period	B100 Production	Total Sales of All Blends	Sales for Resale						
			Subtotal	Sales of B98 - B100	B100 Included in B98- B100 Sales	Diesel Included in B98- B100 Sales	Sales of Other Biodiesel Blends	B100 Included in Sales of Other Blends	Diesel Included in Sales of Other Blends
2009^R									
January	42	39	35	35	35	s	s	s	s
February	33	39	36	36	36	s	s	W	W
March	25	25	23	W	W	W	W	W	W
April	26	27	25	W	W	W	W	W	W
May	29	37	34	W	W	s	W	W	W
June	32	36	31	W	W	s	W	W	W
Year-to-Date	188	204	183	W	W	W	W	W	W

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

W = Withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components due to independent rounding. R=revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 8. Biodiesel Producer Sales, by Blend and Assignment of Tax Credit, January through June 2009
(Million Gallons)

Period	Total Sales of All Blends	Sales of B98 - B100		Sales of Other Biodiesel Blends	
		Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit	Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit
2009^R					
January	39	22	17	s	-
February	39	20	19	s	-
March	25	15	10	s	-
April	27	15	12	s	-
May	37	23	14	s	-
June	36	20	16	s	-
Year-to-Date	204	114	88	1	-

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. The term "tax credit" includes Federal income and excise tax credits for biodiesel blending. It excludes the Federal small producer credit for biodiesel and any State tax incentive. R=revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 9. Biodiesel Producer Revenue, by Blend and Assignment of Tax Credit, January through June 2009
(Million dollars)

Period	Total Revenue from Sales of All Blends	Revenue from Sales of B98-B100		Revenue from Sales of Other Biodiesel Blends	
		Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit	Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit
2009^R					
January	85	41	44	s	-
February	73	35	38	s	-
March	51	24	26	s	-
April	57	27	29	s	-
May	70	33	37	s	-
June	77	36	41	s	-
Year-to-Date	413	197	214	2	-

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. The term "tax credit" includes Federal income and excise tax credits for biodiesel blending. It excludes the Federal small producer credit for biodiesel and any State tax incentive. R=revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 10. Average Price Received by Biodiesel Producers, by Blend and Assignment of Tax Credit, January through June 2009
(Dollars Per Gallon)

Period	Average Price of All Blends	Average Price of B98-B100		Average Price of Other Biodiesel Blends	
		Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit	Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit
2009^R					
January	2.19	1.83	2.67	1.75	-
February	1.88	1.76	2.01	2.20	-
March	2.01	1.68	2.49	1.01	-
April	2.10	1.86	2.43	1.18	-
May	1.87	1.44	2.55	1.14	-
June	2.13	1.81	2.55	0.94	-
Year-to-Date	2.03	1.72	2.43	1.34	-

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. The term "tax credit" includes Federal income and excise tax credits for biodiesel blending. It excludes the Federal small producer credit for biodiesel and any State tax incentive. R=revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 11. Energy Balance of Biodiesel Production, 2008 through June 2009
(Trillion Btu unless otherwise noted)

Period	Feedstock	Alcohol	Losses	Glycerol	B100 Production	B100 Production (Million Gallons)	B100 Production (Thousand Barrels)
2008					87	678	16,145
2009 ^R							
January	5	s	-	-	5	42	1,011
February	4	s	-	-	4	33	780
March	3	s	-	-	3	25	599
April	3	s	-	-	3	26	624
May	3	s	-	-	4	29	689
June	4	s	s	s	4	32	761
Year-to-Date	23	1	s	s	24	188	4,465

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

- = No data reported.

Notes: The following equation represents the energy balance. Feedstock + Alcohol - Losses = Glycerol + B100 Production, all terms in trillion Btu. Totals may not equal sum of components due to independent rounding. R=revised data, applicable to January through March.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey" and EIA-22S, "Supplement to the Monthly Biodiesel Production Survey."