

## The Starch Industry in North America

This study covers the current state of the corn wet milling industry in North America, forecasts future areas of expansion in the industry, and explains how demand for ethanol is impacting all wet milled corn products. We discuss the starch market and look at how new products such as biodegradable plastics are influencing starch usage. The brewing industry is another important starch consumer, and we forecast the price direction of the main brewing grains, starches, and sweeteners. We also examine the state of the ethanol industry and how grain prices and oil prices may affect that industry. With this analysis and our included cost models, you may better anticipate where starch and competing wet milled products may trade in the future so that you can make informed strategic decisions.

### Report Overview:

#### **History of the Corn Wet Milling Industry**

*Figure 1: Major Product Introductions in the Corn Wet Milling Industry*

#### **Current Outlook for the Corn Wet Milling Industry**

*Figure 2: Consolidation of the North American Corn Wet Milling Industry*

#### **Existing Competitive Rivalry between Suppliers**

*Figure 3: Estimated U.S. and Canadian Starch Capacity*

*Figure 4: Estimated Mexican Starch Capacity*

*Figure 5: Estimated North American HFCS-55 Capacity*

*Figure 6: Estimated North American HFCS-42 Capacity*

*Figure 7: Estimated U.S. and Canadian Glucose Corn Syrup Capacity*

*Figure 8: Estimated Mexican Glucose Corn Syrup Capacity*

#### **Threat of New Market Entrants**

*Table 1: New Corn Wet Mill Construction Costs*

#### **Survey of U.S. Corn Wet Mills**

Cargill

Tate & Lyle

National Starch and Chemical Company

Archer Daniels Midland

Corn Products International

CASCO (Canadian Division of Corn Products)

Penford Corporation

Grain Processing Corporation

Roquette

Arancia International

ALMEX

#### **Wet Miller Strategic Outlook**

#### **Corn Forecasts and the Corn Wet Milling Industry**

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### **The U.S. Corn Market**

#### **U.S. Corn Supply and Demand Projections**

*Table 2: Corn Supply and Demand Projections*

### **The North American Corn Wet Milling Industry**

### **The U.S.-Mexican Sweetener Trade**

#### **Sugar and HFCS Outlook**

##### **Decline of U.S. HFCS Use**

*Figure 9: U.S. HFCS Demand*

*Figure 10: U.S. Bottled Water Consumption (gallons per capita)*

##### **Growth Opportunities for HFCS Demand**

##### **Price Outlook for Raw and Refined Sugar through 2017**

*Figure 11: Raw and Refined Sugar Prices*

*Figure 12: Raw and Refined Sugar Prices Estimated through 2017*

##### **HFCS vs. Refined Sugar Pricing through 2017**

*Figure 13: HFCS vs. Refined Sugar Pricing through 2017*

#### **Starch Outlook**

##### **Unmodified Starch**

*Figure 14: Top Seven Users of Pearl Starch by Category*

*Figure 15: Pearl Starch Total Use*

*Figure 16: Pearl Starch Industry Breakdown by Category*

##### **Modified Starch**

*Figure 17: Top Seven Users of Modified Starch by Category*

*Figure 18: Total Modified Starch Use vs. Use for Paper*

*Figure 19: Modified Starch Industry Breakdown*

##### **Future Growth Categories**

#### **Glucose Corn Syrup Outlook**

*Figure 20: Year-on-Year Change in Deliveries of Glucose Corn Syrup*

*Figure 21: Glucose Corn Syrup Deliveries by Usage Category*

#### **The Brewing Industry**

##### **Grains Used in Brewing**

*Figure 22: Trends in Brewing Industry Grain Use (Excluding Malt)*

*Figure 23: Trends in Brewing Industry Sugars/Syrups Use*

*Figure 24: Grain Use by Type*

*Figure 25: U.S. Rice Use through 2017*

*Figure 26: U.S. Corn Use through 2017*

*Figure 27: U.S. Corn Use: Food, Seed, and Industrial through 2016*

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*Figure 29: Corn and Rice Used for Brewing through 2017*

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*Figure 30: Growth in Light Beer Consumption*

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### **Comparative Prices of Competing Adjuncts**

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*Figure 33: Estimated Adjunct Costs for Corn Starch and Brewers Rice*

*Figure 34: Estimated Adjunct Costs for Corn Grits and Corn Starch*

*Figure 35: Estimated Adjunct Costs for Corn Syrup and Corn Starch*

### **The U.S. Brewing Industry**

#### **Anheuser-Busch**

*Table 4: Selected Anheuser-Busch, Inc. Business Units*

**Miller Brewing Company (SAB Miller)**

**MillerCoors Joint Venture**

**Coors Brewing Company (Molson Coors)**

### **Brewing Ingredient Outlook through 2017**

#### **Ethanol and Its Impact on the Corn Wet Milling Industry**

##### **Factors Affecting Ethanol's Market Penetration**

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##### **Dry Milling versus Wet Milling**

*Table 6: Estimated Costs for Constructing a New Ethanol Wet Mill*

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##### **Ethanol Plant Operating Costs**

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*Table 9: Comparison of Ethanol Wet Mill and Dry Mill Operating Costs*

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##### **HFCS versus Ethanol**

*Table 11: Profitability of HFCS-55 vs. Ethanol by Operating Costs*

*Table 12: Profitability of HFCS-55 Compared to Ethanol*

*Figure 38: Indifference Price for Ethanol vs. HFCS-55*

*Table 13: Profitability of HFCS-42 vs. Ethanol by Operating Costs*

*Table 14: Profitability of HFCS-42 Compared to Ethanol*

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##### **Starch versus Ethanol**

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*Table 16: Profitability of Pearl Starch Compared to Ethanol*

*Figure 40: Indifference Price for Ethanol vs. Pearl Starch*

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*Table 17: Profitability of Pearl Starch vs. Glucose by Operating Costs*

*Table 18: Profitability of Pearl Starch Compared to Glucose*

*Figure 41: Indifference Price for Starch vs. Glucose*

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