

The U.S. Sugar Baseline Modeling Framework

USDA releases its U.S. sugar baseline projections at the annual Agricultural Outlook Forum held each February. Baseline projections are a conditional scenario based on specific assumptions about macroeconomics, agricultural policy, weather, and international developments. All commodity baselines incorporate provisions of the Farm Security and Rural Investment Act of 2002 (2002 Farm Act) and assume that its provisions remain in effect throughout the projections period. Additionally, the U.S. sugar baseline incorporates the provisions of the URAA and the NAFTA.

The USDA sugar baseline model currently projects supply, use, and prices out through 2011. The production sector includes sugarcane-producing areas of Florida, Louisiana, Texas, Hawaii, and Puerto Rico. The sugar beet-producing areas include the Great Lakes region (Michigan and Ohio), the Red River Valley (Minnesota and eastern North Dakota), the Upper Great Plains (Montana, northwestern Wyoming, and western North Dakota), the Central Great Plains (Colorado, Nebraska, southeastern Wyoming), the Northwest (Idaho, Washington State, eastern Oregon), and the Far West (California, central Oregon). Acreage allocation decisions are modeled as functions of grower prices relative to alternative crop prices.¹ Crop yield projections are based on observed trends. Regional sugar yield per-acre projections are based on econometric analysis of the relationship between sugar yields and crop yield developments and yearly trend improvements that capture technical improvements in each region.

Sugar production differs from other field crops in that it requires extensive processing to be put in a form that is marketable. Unless processing facilities are close to cropping acreage, it is uneconomical to grow sugar crops. In the baseline model, adjustments to processing capacity are a function of the margin between predicted sugar prices and the average sugar price necessary for processors to cover variable costs. Within a producing region, it is assumed that there is a normal distribution of costs about point estimates reported by USDA.² If the margin drops to zero, the modeling specification indicates the exit of half of processing capacity from that region. It is further assumed that capacity reductions are irreversible; that is, there is a very high cost of reopening closed facilities.

Sweetener demand is composed of end use demands by the beverage and food-processing industries, nonfood demanders, and households or nonindustrial users. Commodity coverage includes not only sugar but also high-fructose corn syrup. In recognition of the importance of NAFTA, the USDA sugar baseline model includes a Mexican sweetener component. Particular attention is placed on modeling how much exportable sugar surplus Mexico possesses throughout the projections period. Substitution tradeoffs in Mexico between sugar and HFCS are of particular modeling concern because of the potential of HFCS to displace sugar, especially in beverage end uses.

¹ See "Calculation of Real Price Indices for U.S. Sugar Crops," in *Sugar and Sweetener Situation and Outlook*. SSS-229, Sept. 2000.

² See www.ers.usda.gov/farmincome for costs of processing for cane and beet sugar.