U.S. GRAINS COUNCIL

THE SUPERIOR PERFORMANCE OF

# U.S. Corn in the Industrial Starch Sector

**Worldwide, the industrial corn starch industry is worth more than $70 billion.** There are 28 industrial starch plants located in the U.S. and another 49 located globally outside of the U.S. These plants use approximately 90 MMT (3.5 billion bushels) of corn annually.

**In research conducted** by the University of Illinois' Integrated Bioprocessing Research Laboratory, corn samples (destination samples) were collected from the warehouse of industrial starch plants from around the world. The logic of sampling at the destination was to accurately reflect the corn that these plants were processing. Samples of U.S., Argentinean, Brazilian, and Ukrainian corn were taken and shipped back to the University of Illinois for analysis.

With two years of data, the results are conclusive, that U.S. corn outperforms other origin corn in terms of starch extractability. U.S. corn gives higher starch yields and shorter processing times, both of which increase the overall profitability of industrial plants. As an example, the higher starch yields of 4-5% in U.S. corn translates to an additional US$6.5-9.0 million of revenue per year for a wet mill plant that processes 1,000 MT of corn per day. In addition, U.S. corn steeping times are only 24 hours versus 48 hours for other origins, giving industrial starch plants the ability to effectively double their throughput in their plants.

## INDUSTRIAL STARCH PLANTS AROUND THE WORLD


*Source: Corn Refiners Association*

# STUDY RESULTS:

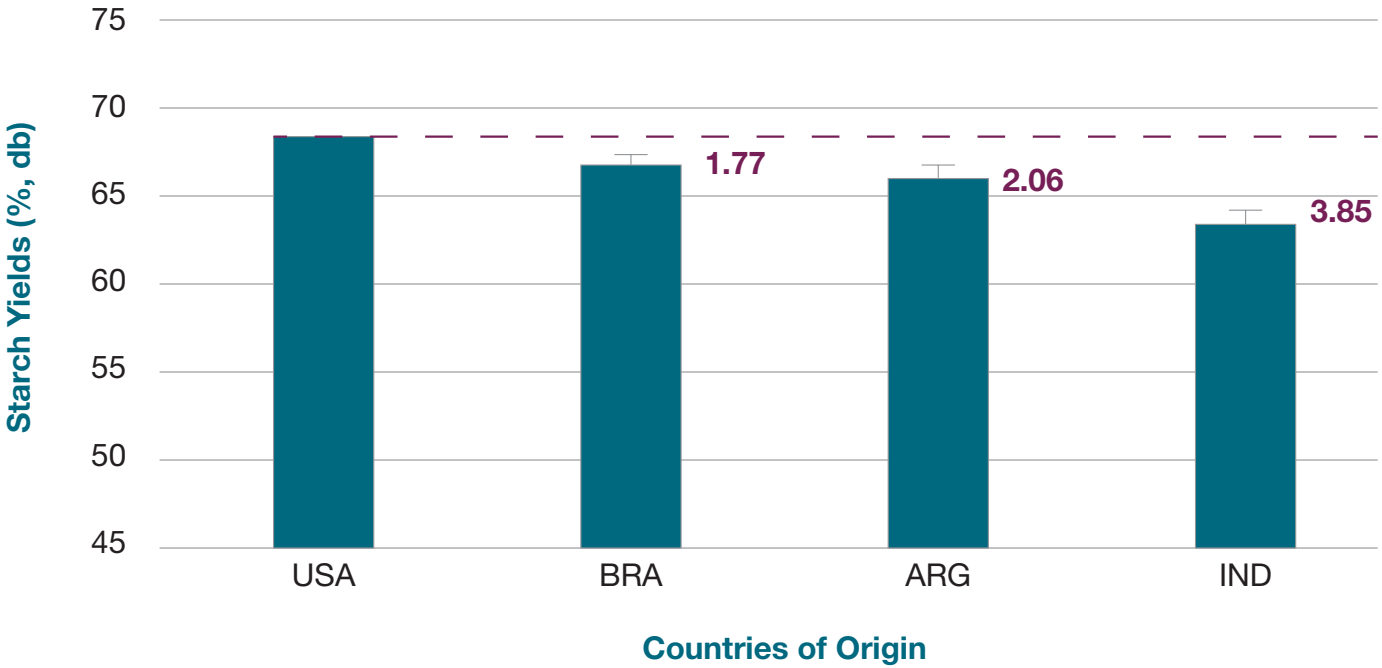
In the two years of data collection and analysis of samples of U.S. corn as well as corn originating from the Black Sea, India, and South America, the conclusions have consistently shown that U.S. corn has notably higher starch yields in wet milling, ranging from 2-4%. It's important to articulate the difference between total "starch content" and "extractable starch". The study shows that as far as starch content is concerned, the ranges for all origins have very similar starch content, testing between 72-73%.

The differences in "extractable starch" are highlighted below as how U.S. corn performs versus Brazilian, Argentinean, and Indian corn. According to the study, extractable corn in this process favors the use of U.S.-origin corn, which registered approximately 67-68% starch yields.

A key component that has explained these findings can be explained through the chemical composition and structure of U.S. corn. U.S. corn has a softer endosperm, which make it more susceptible to damage and to higher levels of BCFM and dust compared to its South American counterparts. This can sometimes be seen as a negative issue in the trade. However, for industrial starch plants this characteristic makes it easier to extract starch, since the starch is not bound up tightly in the kernel.

Additionally, for plants with high levels of broken kernels, they are not able to properly process the corn and, as a result, are losing money. With a small investment the plants can set up a short steeping system for broken kernels and maximize their profit potential. Several international plants have already done this and are seeing increased profitability.

# STARCH CONTENT VS STARCH EXTRACABILITY



# How does this benefit the industry?

This study highlights the opportunity for industrial starch plants to increase their profitability simply by instructing their grain purchasing team to buy only U.S.-origin corn. They do not need to make huge investments into changing plant processes, they just need to focus on receiving U.S. corn into their plants.

For plants that mill over 1,000 Metric tons of corn per day, each extra percentage point of starch extracted is representative of $1 million (USD) per year in additional revenue. Higher starch yields of 4-5% in U.S. corn translates to an additional $6.5-9.0 million (USD) of revenue per year.

In addition, plants can reduce steeping time to 24 hours when processing U.S. corn, as opposed to 48 hours for other origins. Essentially doubling plant output (and profitability), if there are no other bottlenecks in the plant processes.

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***If you choose another source of corn other than U.S. origin, you are passing up an opportunity to increase your plant's profitability.***

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