

A close-up, high-angle shot of a golden liquid, likely ethanol, being poured into a glass. The liquid is captured mid-pour, creating a series of concentric ripples and a bright, shimmering reflection on the surface. The background is a warm, golden glow, suggesting a bright light source. The overall composition is centered and visually striking.

Dispelling the Myths about Water use in Ethanol Production

Presented by Myke Feinman

Biofuels Journal



Myth

**It takes 1,700
Gallons of Water to
Produce a Gallon
of Ethanol**

**This often repeated value is attributed to
David Pimentel from Cornell University**

FACT

**It takes less than 4
Gallons of Water
to Produce a
Gallon of Ethanol**

This value from the
American Coalition for Ethanol (ACE)



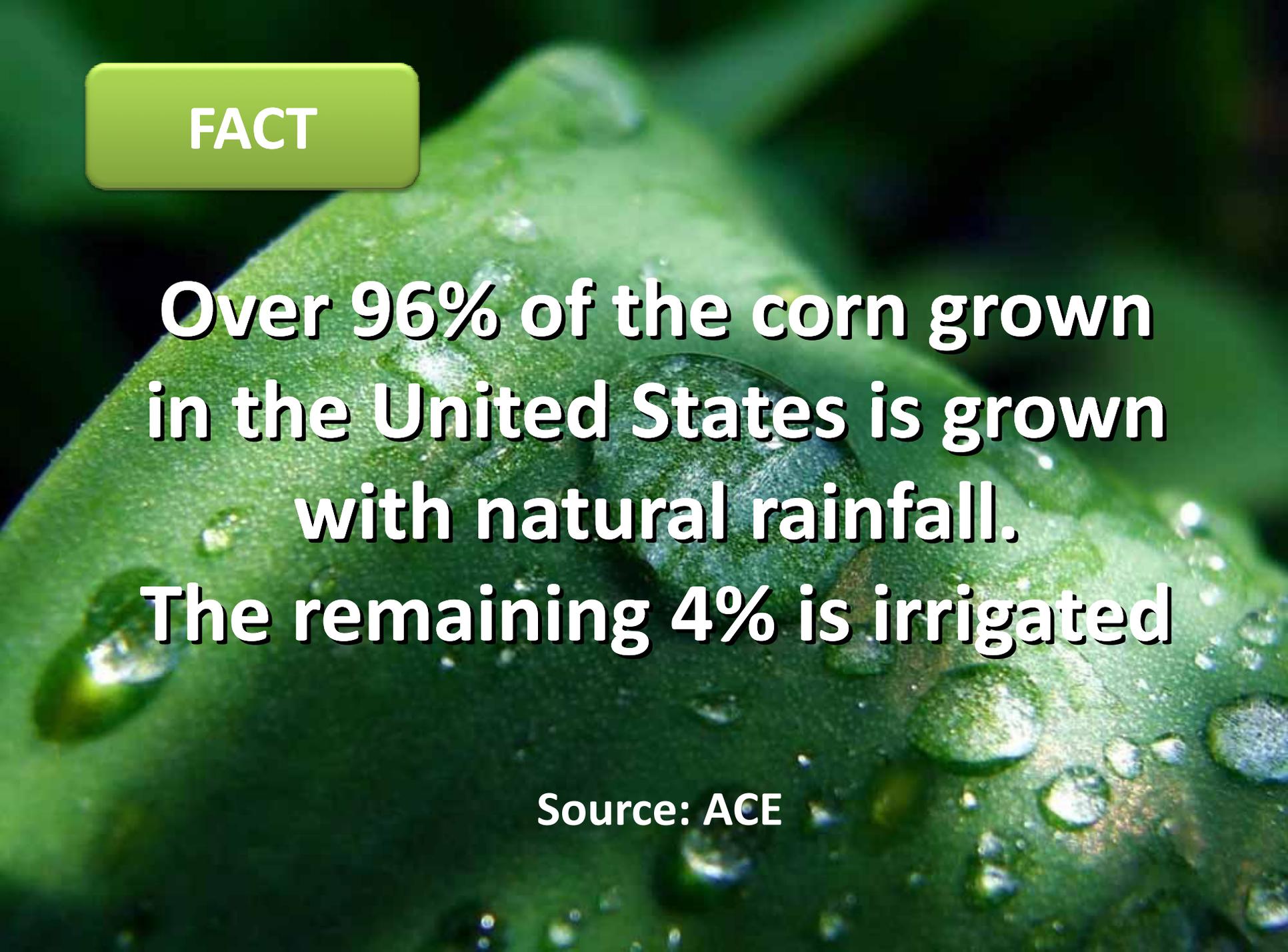
FACT

Water used in the Production of Ethanol at Dry Mill Plants Decreased 26% from 2001 to 2006

Some plants have reduced water consumption to less than 2.8 gallons per gallon of ethanol

Source: Argonne National Laboratory

If the production of one gallon of ethanol actually uses less than 4 gallons of water, then how are the remaining 1,696 gallons of water in Mr Pimentel's value used and where does the water come from?



FACT

**Over 96% of the corn grown
in the United States is grown
with natural rainfall.
The remaining 4% is irrigated**

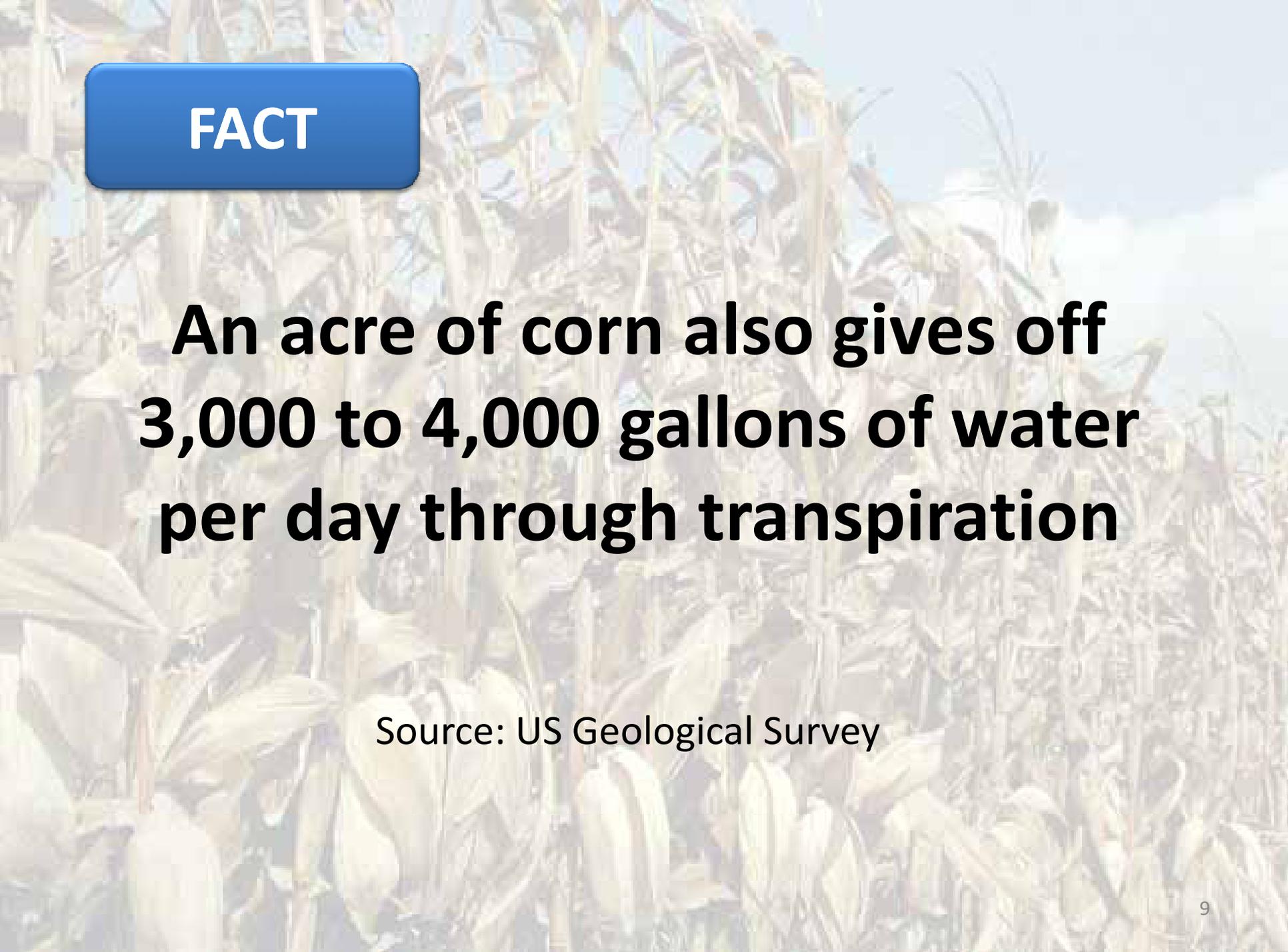
Source: ACE

FACT

Of the corn that is actually irrigated, it requires 785 gallons of water to produce feedstock to produce one gallon of ethanol

Source: American Coalition for Ethanol (ACE)



A background image of a cornfield with tall stalks and green leaves under a clear blue sky. The image is slightly faded to allow text to be read.

FACT

**An acre of corn also gives off
3,000 to 4,000 gallons of water
per day through transpiration**

Source: US Geological Survey



***Myth
Dispelled***

One gallon of ethanol requires 785 gallons of irrigation water to grow the corn for feed stock + 4 gallons of water to manufacture = **789 gallons actual water use.**

A difference of 911 gallons when compared to the widely quoted 1,700 gallon value.

**How does less than 4 gallons
of water required to
manufacture one gallon of
ethanol compare with other
water uses?**

FACT

Water usage to produce a gallon of gasoline is 2 to 2.5 gallons.

There is no recovery of water from the refining process of gasoline.

Source: National Renewable Energy Laboratory (NREL)

FACT

Over 1/3 of the water used in the manufacture of ethanol is recycled in the process.

One trend is to achieve zero waste water discharge from plants - VeraSun's Plant in Welcome, MN has met this goal.



**Municipal waste water plants
treat gray water drained from
sinks and showers at water
treatment plants.**

FACT

Many ethanol plants are finding value in gray water as a replacement for fresh water in the manufacturing process.

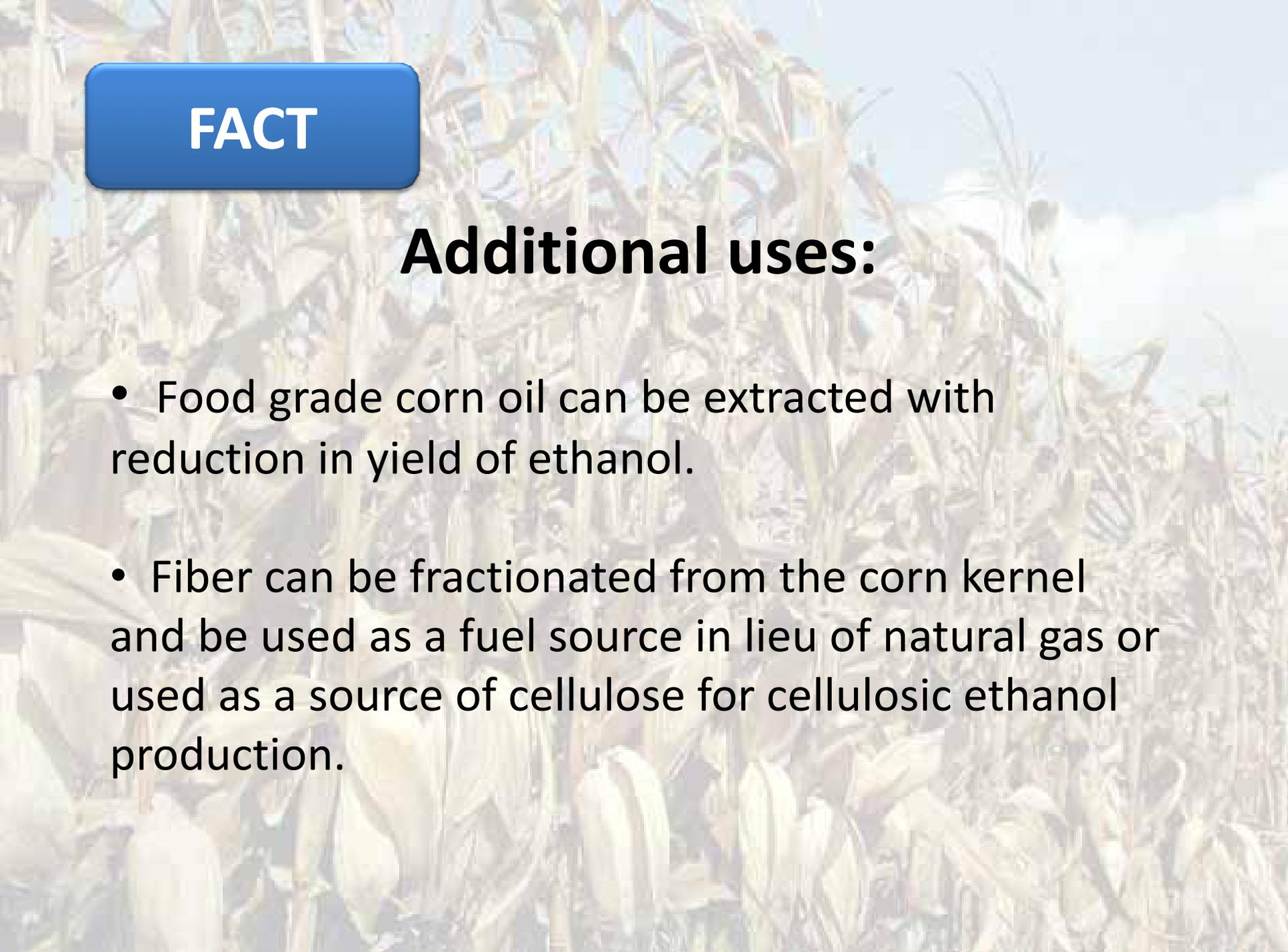
One such facility is the POET plant in Corning, Iowa which uses gray water for its cooling tower saving 40% of their fresh water requirements.

In addition to having the ability to utilize “gray water” in the manufacturing process, ethanol production yields many useful by-products as well.

FACT

Production of ethanol produces these useful by-products further adding to the value of the water used in the manufacturing process.

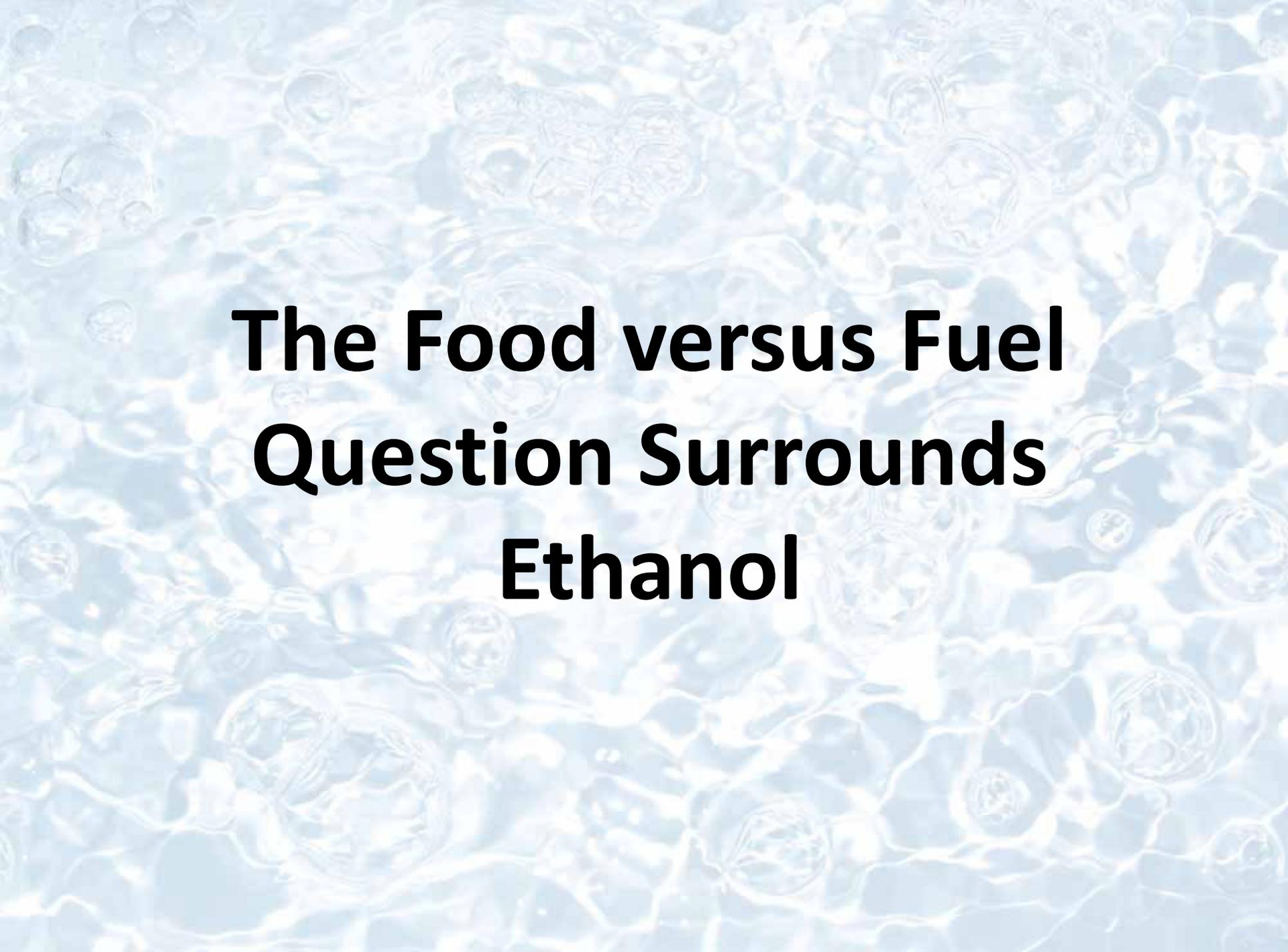
- Dried Distillers Grains with Solubles (DDGS) which are used a livestock feed
- Carbon Dioxide which, if captured can be used in a number of industrial and food applications
- Corn Oil extracted from DDGS which is a prime feedstock for biodiesel production



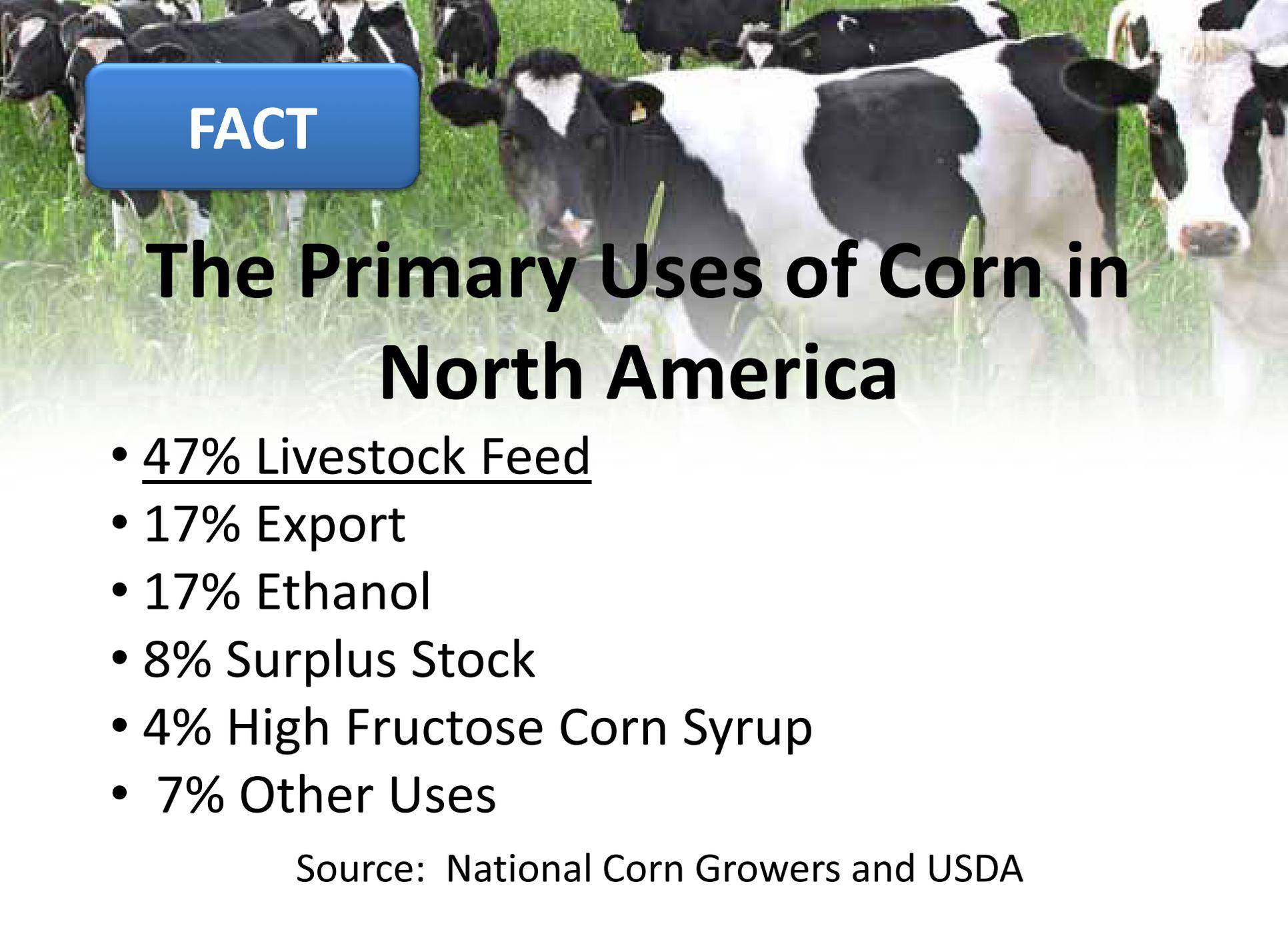
FACT

Additional uses:

- Food grade corn oil can be extracted with reduction in yield of ethanol.
- Fiber can be fractionated from the corn kernel and be used as a fuel source in lieu of natural gas or used as a source of cellulose for cellulosic ethanol production.

The background of the slide is a light blue, textured pattern of water ripples, creating a shimmering, organic effect. The ripples are of varying sizes and orientations, giving the impression of sunlight reflecting off a body of water.

The Food versus Fuel Question Surrounds Ethanol

A photograph of a herd of black and white cows in a green field. The cows are scattered across the frame, with some in the foreground and others in the background. The field is lush and green, suggesting a healthy pasture. The cows are of various breeds, including Holsteins and Friesians.

FACT

The Primary Uses of Corn in North America

- 47% Livestock Feed
- 17% Export
- 17% Ethanol
- 8% Surplus Stock
- 4% High Fructose Corn Syrup
- 7% Other Uses

Source: National Corn Growers and USDA

Is Ethanol Production a Wise use of Water Resources - A Financial Perspective -



FACT

- Ethanol Production 2007: 6.5 billion gallons
- Employment for 238,000 People
- GDP Contribution \$47.6 billion
- Federal Tax Revenue: \$4.6 billion
- State and Local Revenue: \$3.6 billion
- Reduction in Farm Subsidies: (\$8 billion)
- Saved Import of Oil: 228 million barrels or \$16 billion dollars

Source: Bob Dinneen - Renewable Fuels Association Feb 2008



**Is ethanol production a wise use
of water resources?**

Given the facts, I believe it is!

**Thank You for Your Attention
Questions?**