Bio-innovations that Reduce Food Waste and Loss

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Fewer apples wasted, fewer acres needed

40% Wasted
40% of apples never get eaten

Reduce loss
deliver higher quality apples
Apple FLW is happening all along the supply chain

ON FARM
- Pests
- Weather
- Storage
- Handling
- Quality

PACKING & PROCESSING
- Storage
- Handling
- Damaged Fruit

RETAIL
- Storage
- Handling
- Quality

CONSUMERS
- Poor planning
- Preferences
- Storage
Biotechnology is a solution
Arctic® apples do not brown when bruised or sliced

we simply used the apple’s own genes to “turn off” the specific enzyme that makes apples brown when cut or bruised.

Polyphenol Oxidase (PPO) Enzyme*

*Apple cells are damaged through biting, slicing and bruising. The damage causes PPO enzymes to initiate browning. By suppressing the PPO enzyme, enzymatic browning is reduced.
OSF is a vertically integrated fruit tree business

focused on eliminating waste and putting more apples in more places

R&D
OSF employs the latest tools, including biotechnology, to bring new traits to fruit trees

Orchards
OSF is innovating advanced orchard practices to ensure efficiency and sustainability

CA
Vertical integration gives us control over all aspects of the business, including on-site controlled atmosphere facilities

Processing
OSF operates a 110,000 ft² state of the art processing facility where apples are stored, sorted, sliced and packed

Premium Products
Sustainability is in our DNA

We are committed to the health of people and the planet

Environmental Sustainability

OSF is taking on the food waste challenge and reducing GHGs.

- OSF is working toward goal of **zero waste.** Reducing waste along supply chain and more uses for apple products
- Our 28-day extended shelf life means more apples won’t get wasted
- OSF only ships the parts of the apple that are consumed, reducing freight weight by up to 30%
- Our proximal facilities allow us to slice on demand, reducing shipping and waste

Health and Nutrition

Only 1 in 10 US adults consumes the recommended daily allowance of fruits and vegetables. Only 1 in 3 kids consumes a daily fruit.

- OSF brought apple into the fresh-cut category to drive consumption. Because kids are 71% more likely to eat a sliced apple compared to a whole one.
- Our nonbrowning Arctic technology allows foodservice to put more apples in more places, increasing healthy options
- Half of Americans’ eating occasions are snacking on the go — Arctic® apples are convenient and packable
Benefits Derived by Bt Eggplant Growing Farmers

- Negligible fruit infestations in Bt eggplant compared to 45% in the non-Bt eggplant.
- 61% saving on pesticide cost to farmers as compared to non-Bt eggplant farmers.
- 6X increase in farmers' net returns to $2,151/ha for Bt eggplant/ha as compared to $357/ha for non-Bt eggplant.
- 21% increase in gross revenue.
- 19.6% higher fruit yield in Bt eggplant against non-Bt eggplant.
- 41% reduction toxicity of pesticides applied, measured by Pesticide Use Toxicity Score (PUTS).
Genome editing is a new opportunity for reducing FLW

60% of exported bananas are wasted pre-consumer
Emerging biotechnologies like CRISPR are helping improve perceptions of GMOs

Several independent studies suggest US consumers don’t know much about gene editing but when they learn more about benefits, the majority feel positive about it. \(^1,2\)

Sources: \(^1\)Alliance for Science, 2022, [https://bit.ly/3Qfto2l](https://bit.ly/3Qfto2l), \(^2\) FMI, 2020,
Consumers embrace of genome editing for personal health and environmental benefits

US consumers are especially excited about the role of gene editing in:\(^1\):

- Making food more nutritious
- Making food production more environmentally sustainable
  - Reducing pesticide use
  - Reducing water use

Sources: \(^1\)Alliance for Science, 2022, [https://bit.ly/3Qfto2I](https://bit.ly/3Qfto2I), \(^2\)FMI, 2020,
US Consumers are ready for GMO Fruit

Pinkglow Pineapple: Bioengineered to produce lycopene

Sales for the pink fruit have **more than doubled** over last year, showing success by delivering a consumer choice

Views of ag biotechnology are favorable among 62% of US voters

Key finding of a survey of 1991 registered US voters in 2023:

Biotechnology and agricultural biotechnology are viewed positively by majorities of U.S. voters (62%) and most respondents whose opinions have shifted over the time indicate their views changed for the better.

*BIO survey by Morning Consult, July 2023

The media environment is GMO favorable
As a company, our goal is zero waste

Hard Cider as an upcycling opportunity with Endless Orchard

Biggest challenge to achieving our zero waste goal is GMO hesitancy

Call to action: Let’s collaborate to help dispel misinformation and promote biotechnology as part of the FLW solution
Trade-offs: Produce’s Plastic Problem
THANK YOU
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For company information and partnership opportunities, visit www.okspecialtyfruits.com.

For consumer information about Arctic apples, visit www.arcticapples.com