

The logo for Bright Farms is centered on the left side of the slide. It features a bright yellow sun with rays, partially obscured by a circular frame that looks like a woven basket or a similar texture. Inside this frame, the word "BRIGHT" is written in a large, bold, dark green sans-serif font, and the word "FARMS" is written below it in a smaller, bold, dark green sans-serif font with a registered trademark symbol (®). The background of the entire slide is a dark green, textured pattern of leaves.

BRIGHT
FARMS®

Food Safety Summit Session 8

Data Driven Analytics and Insights
Enhancing Traceability and Food
Safety Programs

Matt Lingard, PhD
VP of Agriculture and Science, BrightFarms

Modern agriculture faces major challenges



Deforestation

Can lead to deforestation, biodiversity loss, and increased greenhouse gases



Water Usage

Agriculture accounts for over 80% of the nation's water consumption



Fertilizer Run-Off

Can cause environmental damage, such as algal blooms & fish kills



Pesticides

Can degrade the environment by affecting non-target organisms



Food Safety

Lettuce now surpasses Beef as the #1 contributor to *E. coli* hospitalizations

Additional challenges in fresh produce production



Outdoor farms can be vulnerable to pathogen risks



Centralizing processing facilities & co-mingling of product reduces traceability



Long, complex supply chains with large carbon footprints

95%

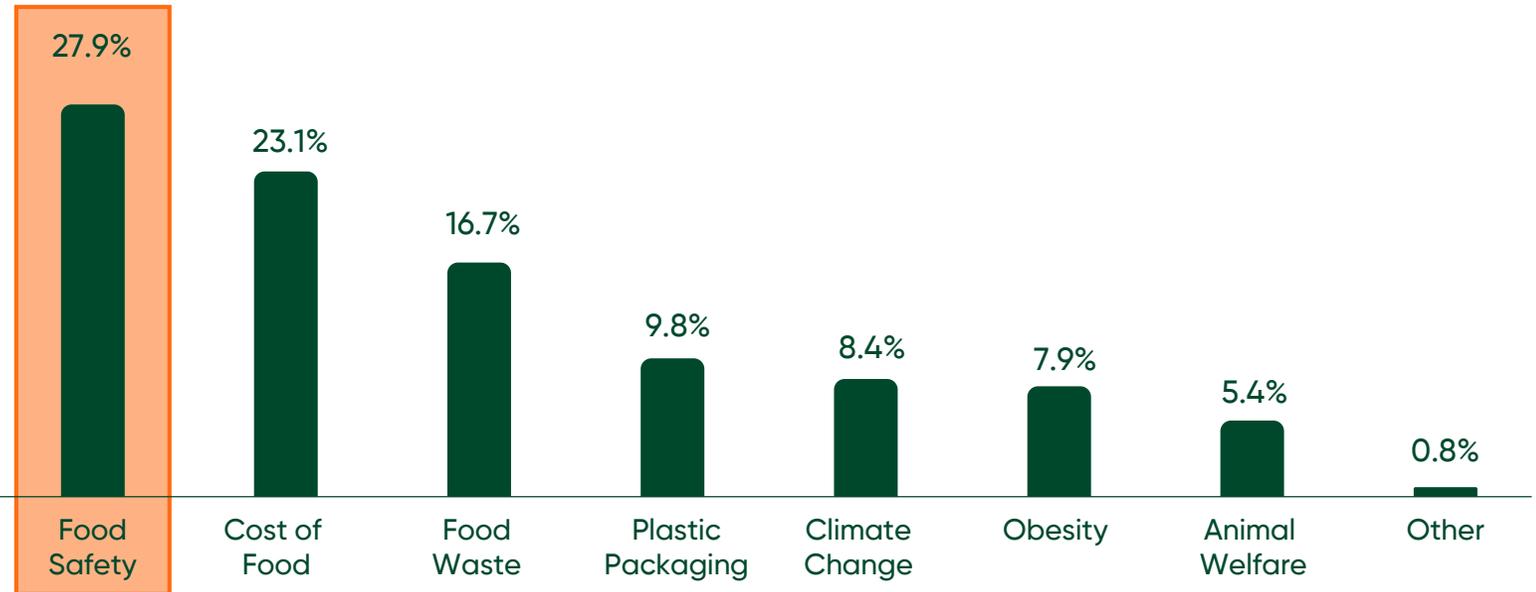
of Lettuce Consumed in the US Comes from either Salinas, CA or Yuma, AZ





Food safety is the most pressing issue facing the food industry today

What do you think is the **most pressing issue** the food industry should address?



Controlled Environment Agriculture (CEA) Addresses these Issues



Indoor growing environments can be more effective at managing pathogen risks



Decentralized farms; product never co-mingled



Short, simple & transparent supply chain

Growing Indoors

Indoor grown produce is expected to double in sales in the next 5 years



\$500M

Investments in Indoor Farms totaled a record high in 2020



LESS WATER
Than long distance supply chains



LESS LAND
Than long distance supply chains



LESS FUEL
Than California producers

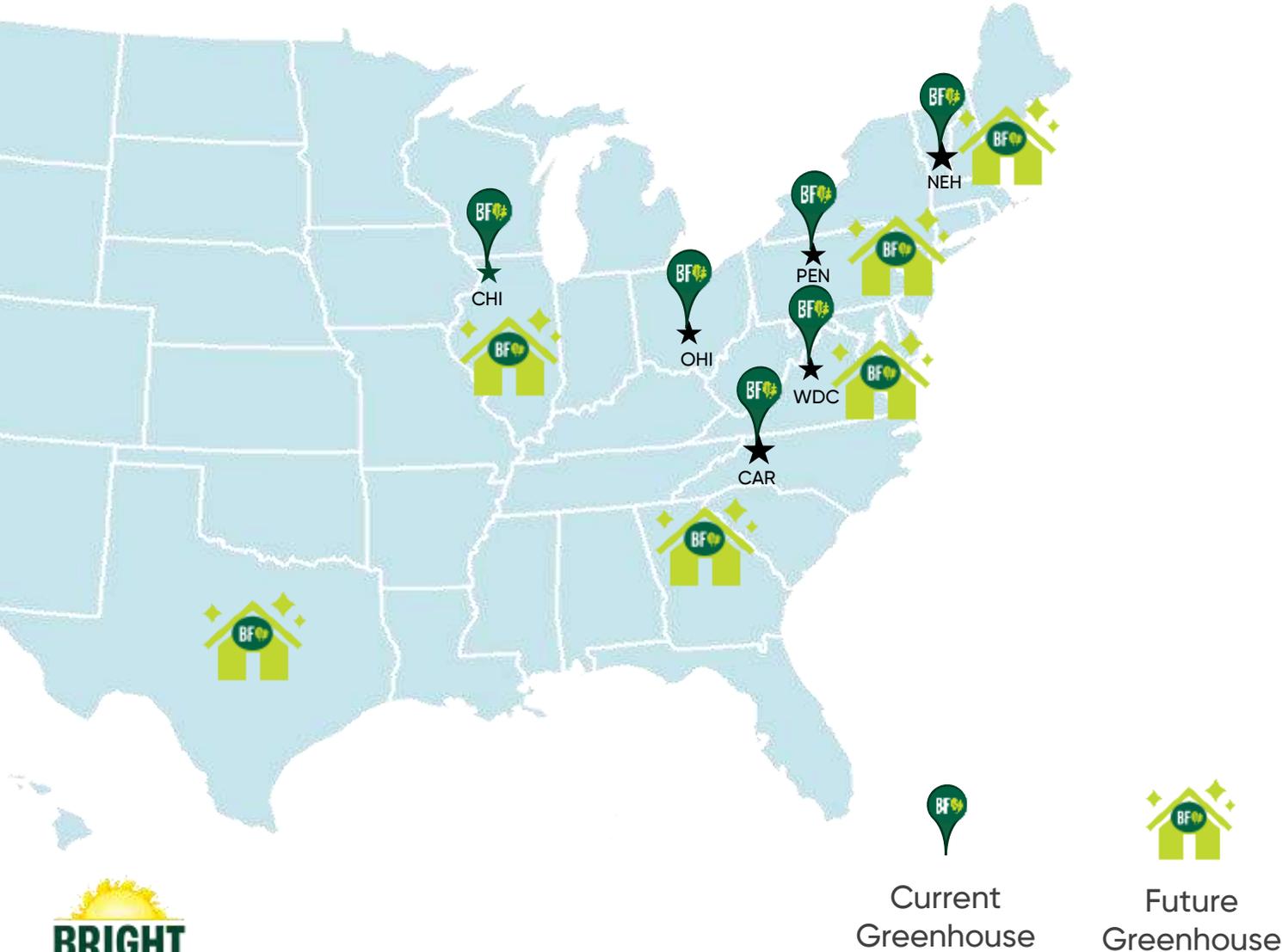
+50%

Indoor Grown Produce grew over 50% from 2014 to 2020 with over 790 million lbs sold

Source: LA Times, 1.21.2012, Attest (Consumer Research Group), "What are American Grocery Shoppers Hungry for in 2021" webinar,



BrightFarms has 6 greenhouses located outside major metros areas and growing



OUR FARMS

24	365	0
Hours from harvest to store	growing days/year	pesticides or herbicides





BrightFarms' greenhouse operations

The CEA industry

(Controlled Environment Agriculture)

Two Unique Farm Types

"Powered by Sunlight"

*Plants stacked horizontally in rows
Powered by Sunlight*



"Powered by Artificial Light"

*Plants stacked in layers
Relies on artificial light for growth*



The CEA industry has attracted more than **\$1B** in investments since 2015

step 1:



Seeds selected from the best genetics

step 2:



Seeds planted on soilless medium in grow boards

step 3:



Greens grow on boards, soaking in sunlight and nutrients until harvest

step 4:



Lettuces are harvested from the boards

step 5:



Leaves are packed into clamshells

step 6:



Clamshells are assembled into boxes

step 7:



Product placed on trucks & delivered <24 h from harvest



The BrightFarms growing model



BrightFarms products are 100% traceable, never comingled, and travel short distances



BrightFarms production systems controls for multiple food safety risks

All inputs are tested for human pathogens

Seeds



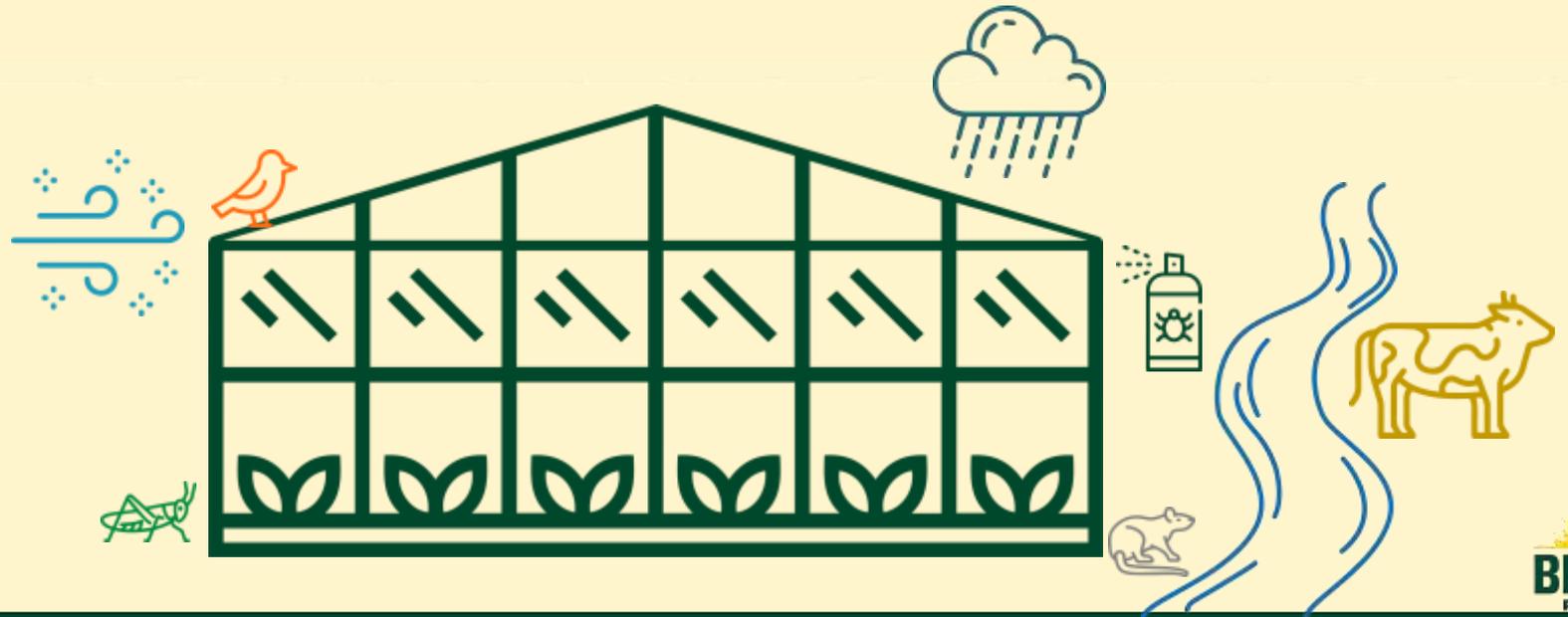
Soilless media



Potable water



Many pathogen vectors are excluded





Evolution in BrightFarms' Food Safety Programs

The First Outbreak Investigation Linked to CEA



Matrix Sciences
hired to assist in
the Root Cause
Investigation
July 18, 2021



BrightFarms
completes
recommended
improvements at all
farms
Jan 1, 2022

Today
Share outcomes
at Food Safety
summit



BrightFarms
voluntary recall
July 15-28, 2021



BrightFarms
collaborates with
FDA and collects
over 800 samples
July- Aug 2021

FDA finds no
systemic issue with
farm or root cause
Jan 14, 2022



BrightFarms
presents
lessons learned to
the CEA Food
Safety Coalition
March 3, 2022

Lesson 1: Invest in food safety science & culture

Expanded food safety support with dedicated on-farm practitioners (2 to 10 FSQ members)



Better engagement & education: anonymous surveys, multilingual, video-based education



Expanded, deeper external expert collaborations



iFoodDS

From data logging to data insights



Controlled pathogen challenge studies

Microbiome company



Seeking insights into microbial balance



Uniform food safety standards for all CEA operators

Lessons 3: Opportunity for new (and evolving) detection methodologies



Unparalleled traceability vs field grown

Location can be isolated very quickly due to no comingling & farm-specific labeling.

Farms not impacted can continue to service retailers/consumers.



Year-Round operating models require a different approach vs field grown

Continuous grow and packing operations call for rapid vectoring of contaminants

CEA facilities do not simplify root cause analyses

Long turn-around times on Ag water samples & mixed growing/packing operating model



We're driving an evolution in CEA food safety

Culture



With 365 operations, we are focused on growing employees and invest in their development

Research



CEA is rooted in technology; extending that focus to Food Safety is in our DNA

Education



Sharing with customers, consumers, academics, & regulators science-based assessments of benefits & risks

Prevention



Because there is no kill step with leafy greens, we focus on excellence in detection & sanitization



Thank You