Opportunities and Challenges Commercializing Quality Traits

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Monsanto Company

Monsanto is 100% Focused on Agriculture

Monsanto Company is a leading global provider of technology-based tools and agricultural products that improve farm productivity and food quality.

Our Mission

- ***Meet the world's growing food needs***
- ***Conserve natural resources***
- ***Protect the environment***
- ***Improve Lives***

"We succeed when farmers succeed."

Monsanto Global Recognitions

GREAT PLACE TO WORK®

ARGENTINA | BRAZIL, CENTRAL AMERICA & CARIBBEAN | CHINA
COSTA RICA | GUATEMALA
INDIA | LATIN AMERICA
MEXICO | PUERTO RICO

Fresh Produce Value Chain – US Market

$122B Consumers

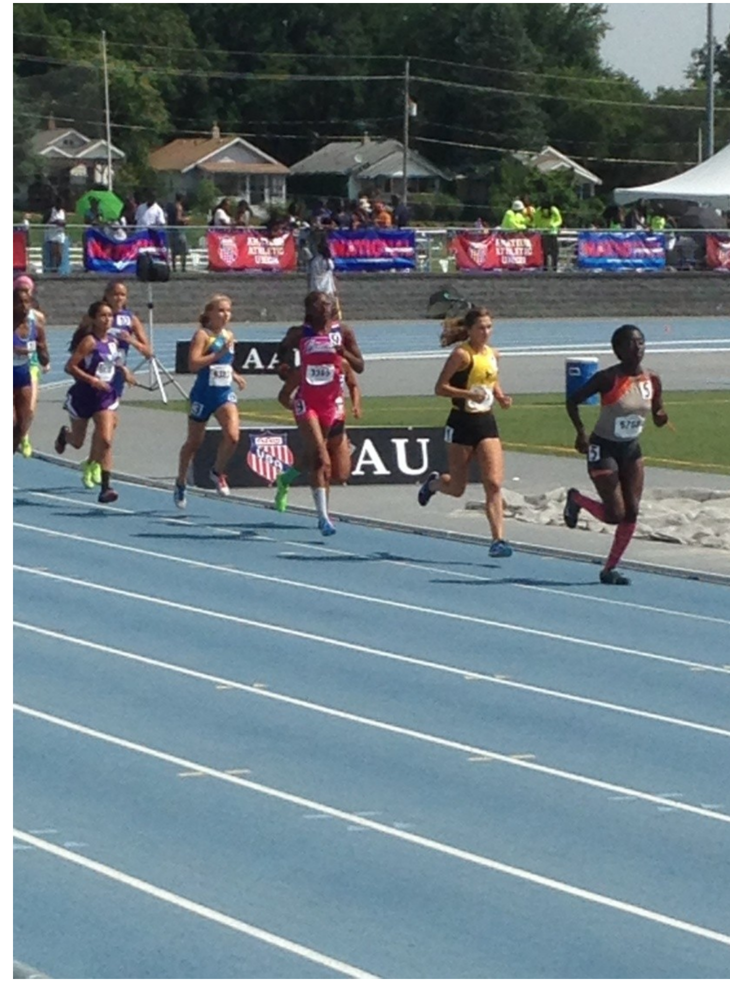
$69.2B Retail

$51.1B Foodservice

$26.8B Farmgate

$500M Seed

2010, Roberta Cook

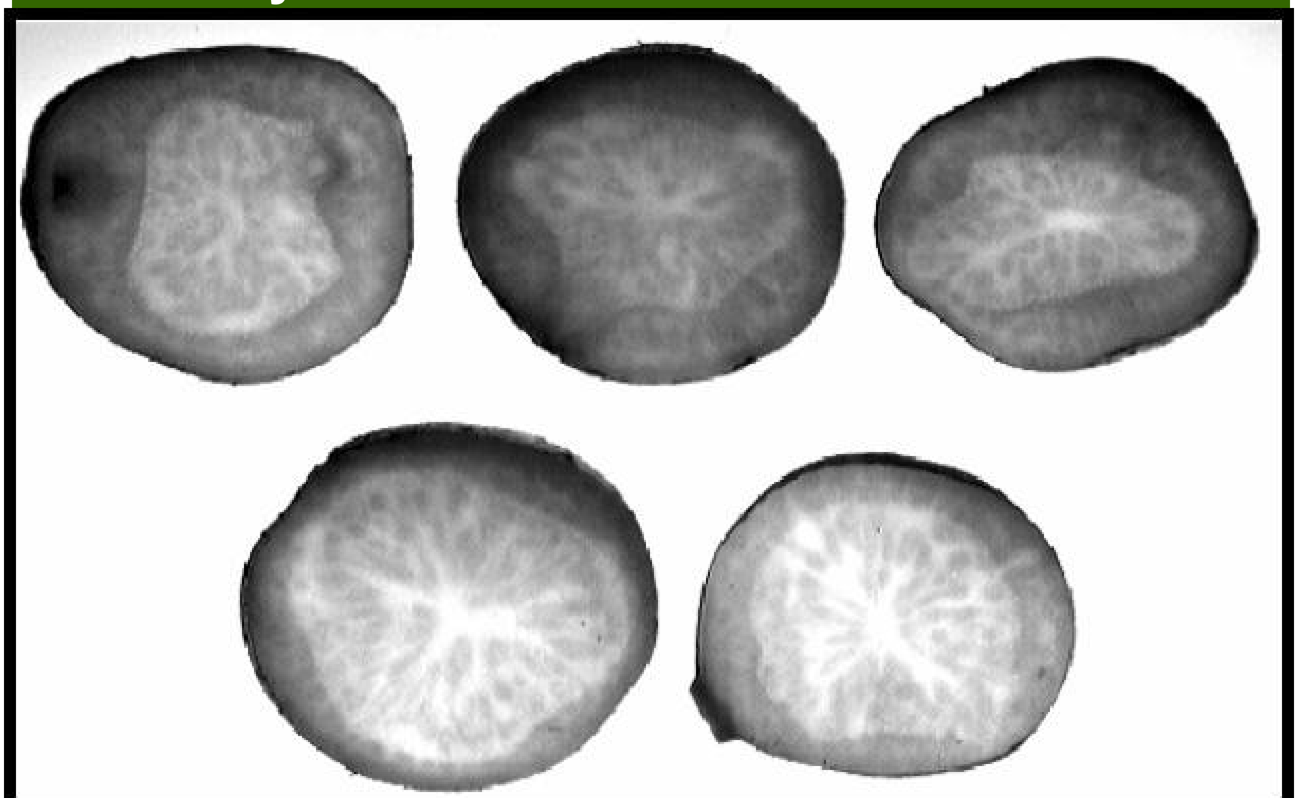


Two main approaches to health and nutrition

Improved Potato Solids Concept:

Lower fat, better quality and flavor fries and chips

Potato Tuber Cross-Sections of Improved Solids Uniformity Russet Burbank Lines



Top Row:
Tubers from 3 transgenic Russet Burbank lines: expressing solids uniformity

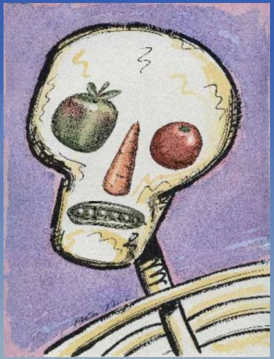
Bottom Row:
Tubers from unimproved Russet Burbank.

Anti-Bruise Technology

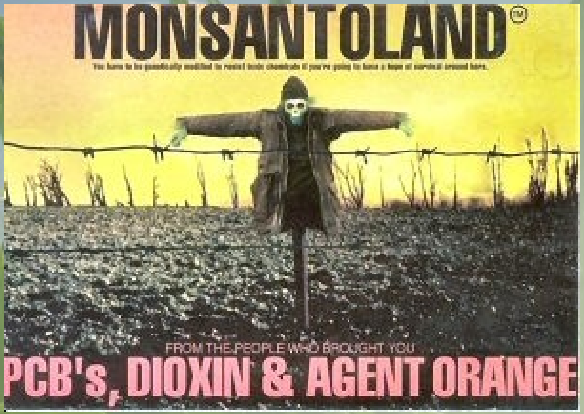
Anti-Bruise Russet Burbank Line

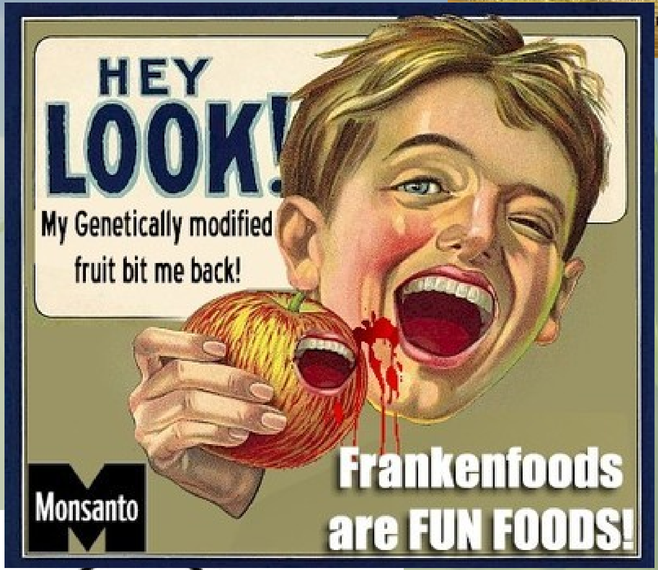
Bruise Susceptible Russet Burbank Line


THIS GIFT WAS TO HELP YOU ERADICATE COMMUNISM...
..THIS ONE IS TO HELP YOU ERADICATE ANY SUSTAINABLE SELF-SUFFICIENT AGRICULTURE
AGENT ORANGE
1960s 1970s
4 MILLION VICTIMS
GMO $
VIET
NAM
MONSANTO
CLAUS
WWW. CORPWATCH. ORG

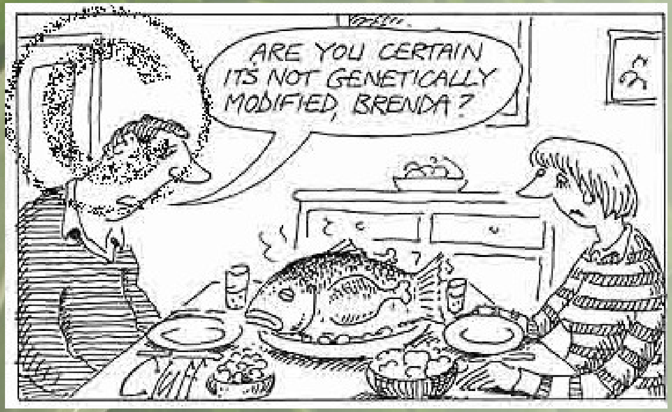


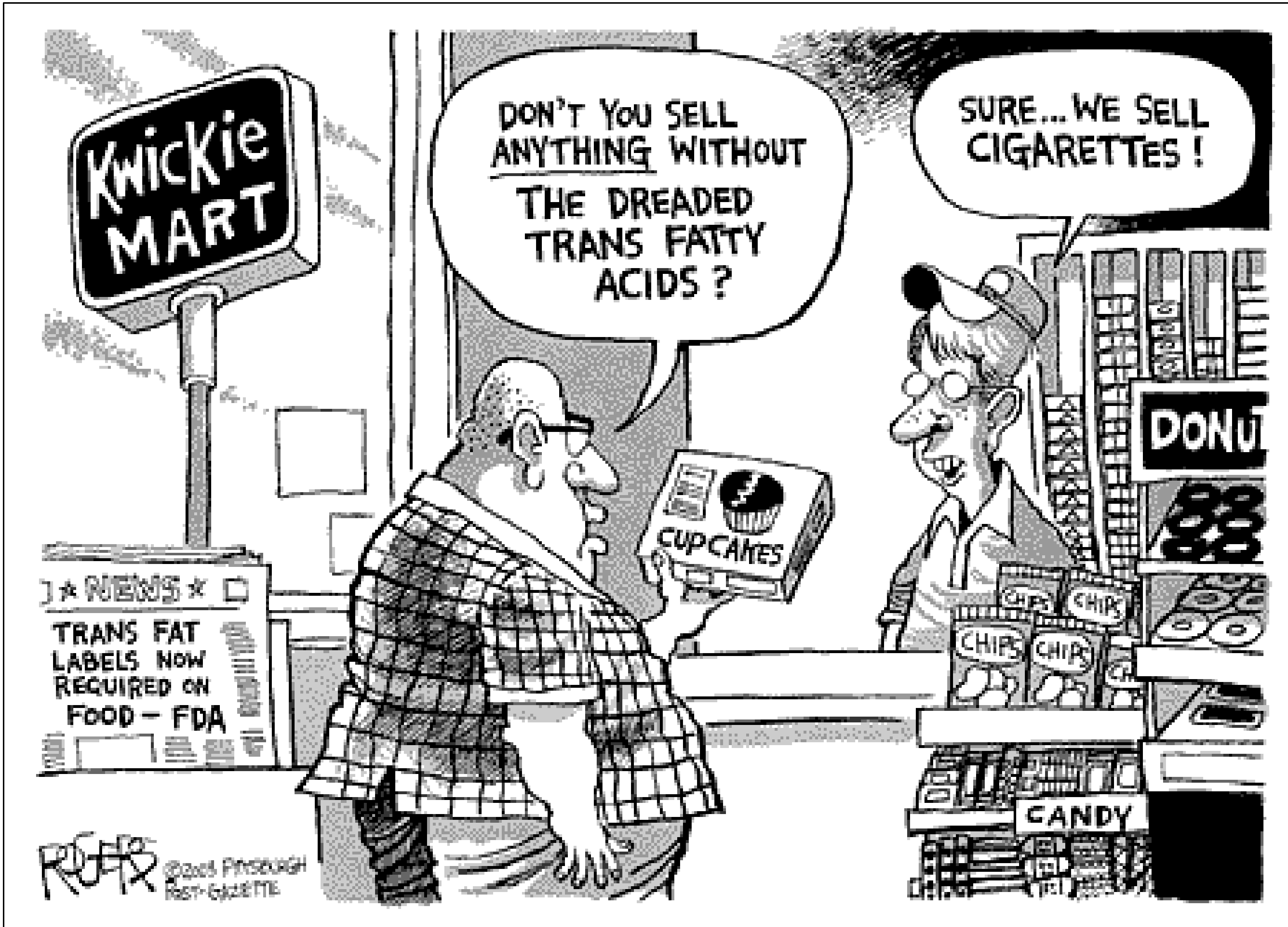

On the Eighth Day...
Monsanto's playing God with soybeans, genetically
engineering them into a cash crop, but they may be
paradise


MONSANTOLAND™
FROM THE PEOPLE WHO BROUGHT YOU
PCB's, DIOXIN & AGENT ORANGE


HEY
LOOK!
My Genetically modified fruit bit me back!
Frankenfoods are FUN FOODS!
Monsanto


Monsanto Man
Tip for a healthy lifestyle: eat your greens before they eat you.
is living proof that vegetables are bad for you....
He has recently been linked to a sinister vegetable plot.


ARE YOU CERTAIN IT'S NOT GENETICALLY MODIFIED, BRENDA?


KWICKIE MART
DON'T YOU SELL ANYTHING WITHOUT THE DREADED TRANS FATTY ACIDS?
SURE... WE SELL CIGARETTES!
NEWS
TRANS FAT LABELS NOW REQUIRED ON FOOD – FDA
CUPCAKES
CHIPS
CHIPS
CHIPS
CHIPS
CANDY
ROGERS

[WHO targets a trans fat-free Europe](http://www.foodnavigator.com/Legislation/WHO-targets-a-trans-fat-free-Europe)

By Caroline Scott-Thomas, 19-Sep-2014

The World Health Organization (WHO) has called for a complete ban on trans fats throughout Europe as part of a new action plan on diet and health.

http://www.foodnavigator.com/Legislation/WHO-targets-a-trans-fat-free-Europe

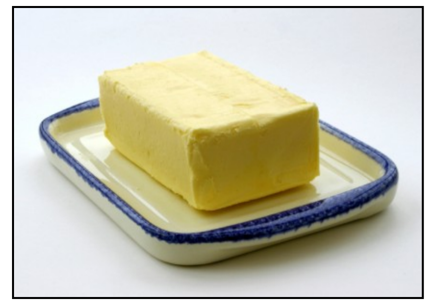
Industry Challenge

Before Trans Fat

One soybean

One oil

Hydrogenation



After Trans Fat

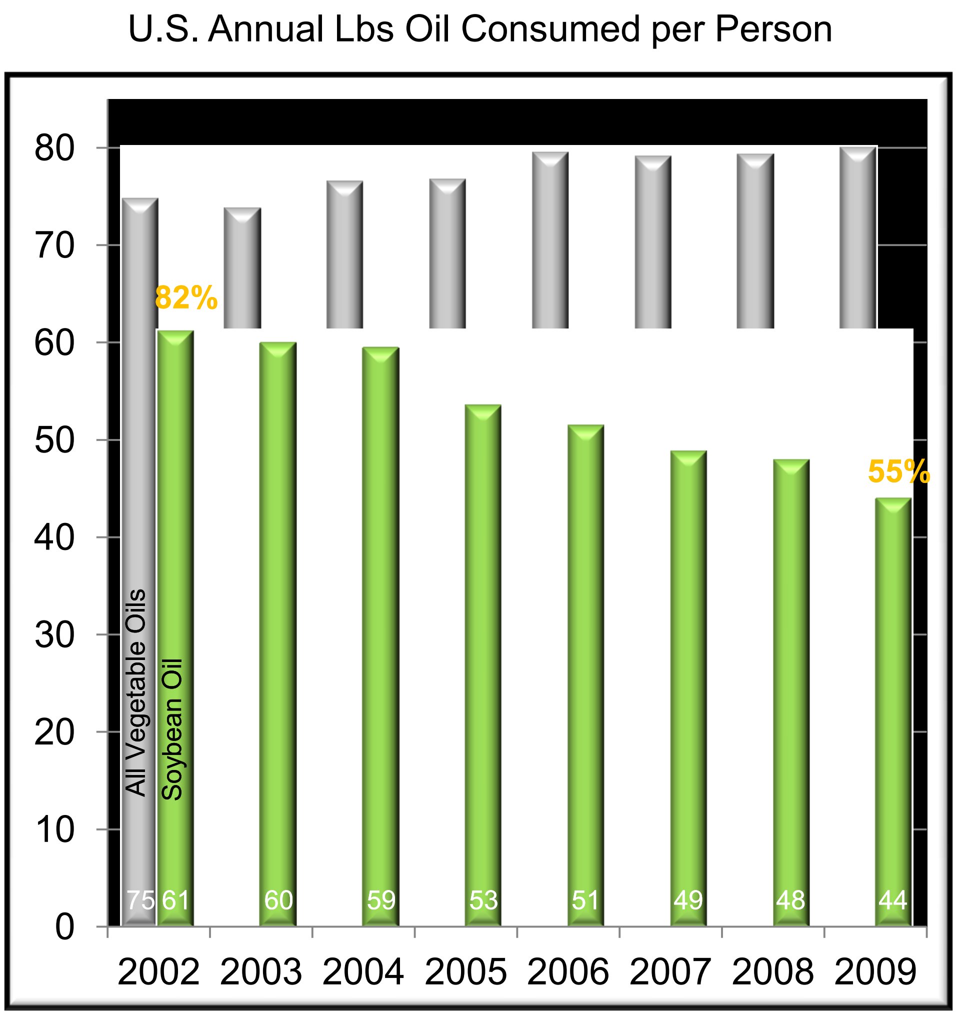
Several soybeans

Several oils

All ‘soybean oil’, but each one is different

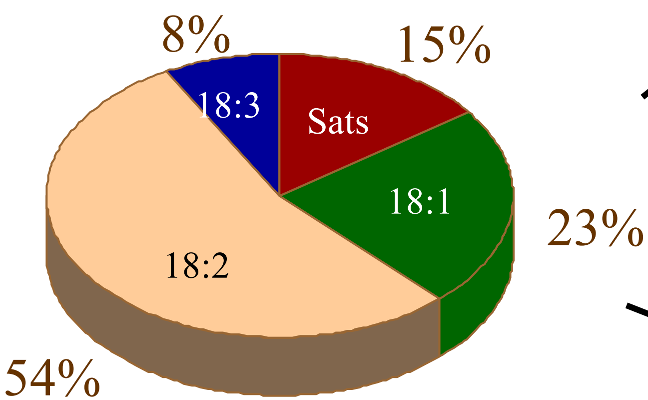
12

Soybean Oil Share of US Food Market

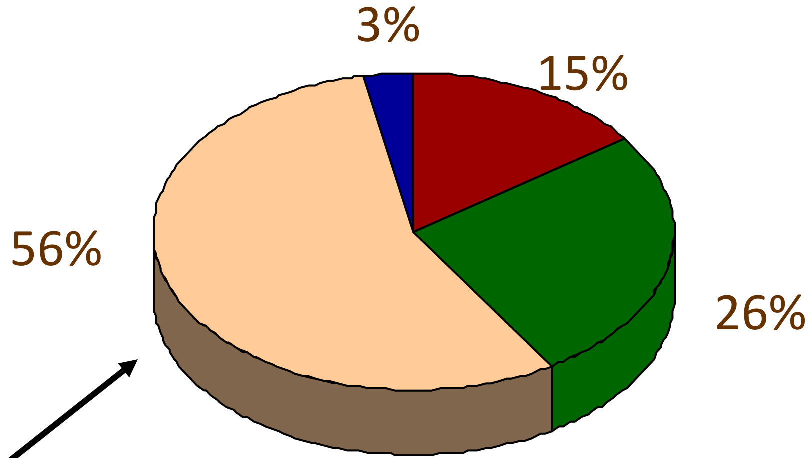


Trans Fat Legislation

Vistive
a better soybean oil, naturally

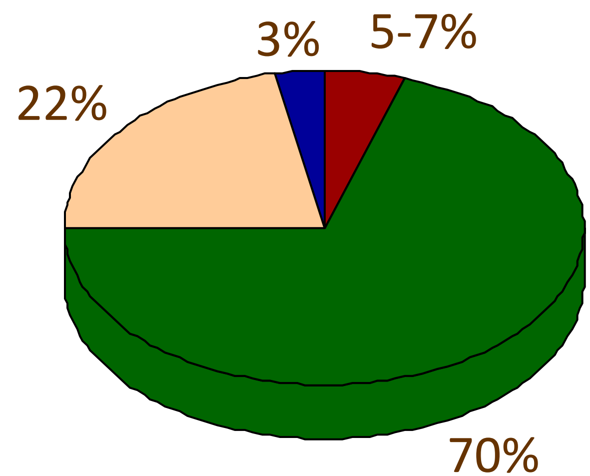


Vistive low lin



Vistive Gold

(high oleic, low lin)



Supply chain challenges; seed production decisions made several years in advance of oil supply – Not *Just-In-Time*!

2009 delivery of oil

Farmers contracted by Feb. ’08

Seed production contracts finalized March ‘07

Seed decision Sept. ‘06 (normal cycle)

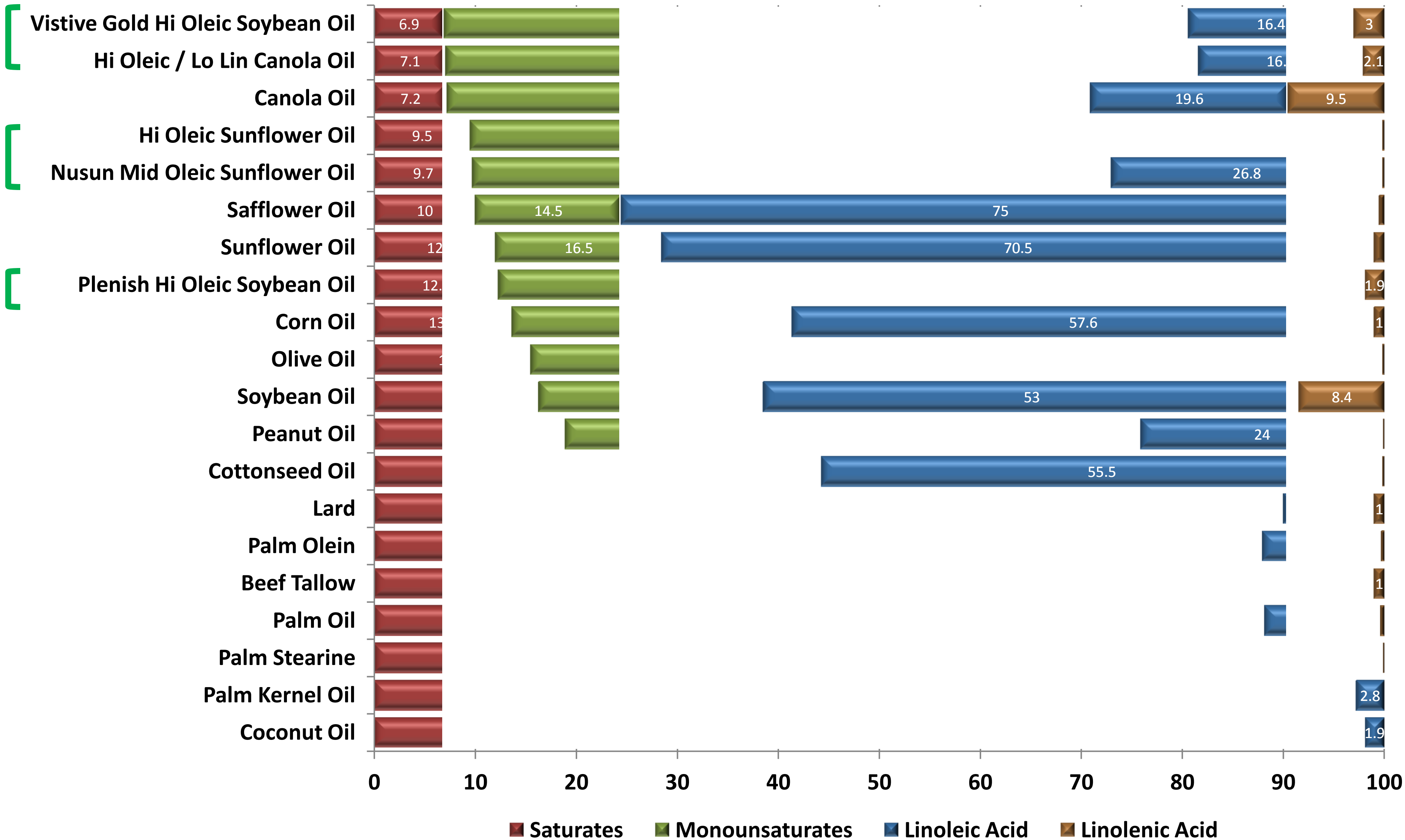
Low Linolenic Soy

Overall not a success

- Limited value (oil life, polymerization, cost)
- Slow, expensive grower adoption
- Yield drag in early years
- Volume limited; supply not reliable
- Food co reformulation costs

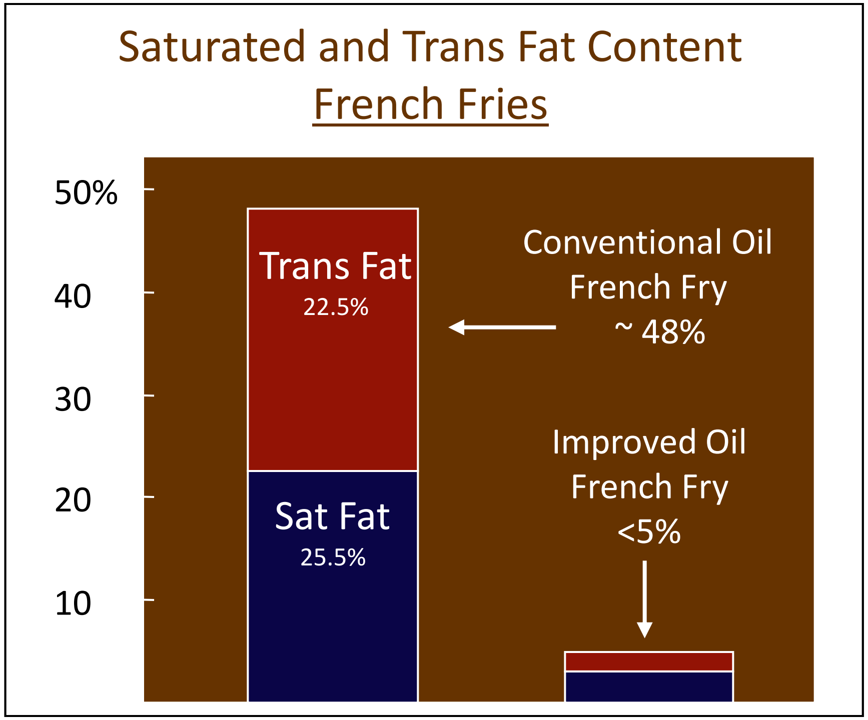
✓ Built IDP system

Fatty Acid Composition



90% reduction in saturated fat and trans fat*.

3.5 oz serving of French fries with 8 fewer grams of bad fat's.



-great performance, oil life, flavor

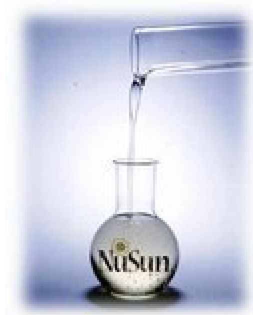
- becoming more cost competitive

- grower adoption

*Versus hydrogenated oils

High Oleic Oils…

HIGH OLEIC



Vistive Gold

Clear Valley
pure performance

Omega-9 Oils
Healthier Oils. Healthier Business.

Vistive
a better rapeseed oil, naturally

…a success

fruits and vegetables

EAT 5 A DAY for better health

fruits & veggies more matters

FRUITS & VEGGIES! HALF YOUR PLATE

- 26.3% American adults $\geq$ 3 vegetables (2009)
  - Down 0.4 points from 2000

- 32.5% American adults $\geq$ 2 fruit (2009)
  - Down 1.9 points from 2000

- In Europe, 2008 vegetable consumption decreased 14.2% vs. last 5 year average (based on supply)

"Most people, regardless of the country that they live in, simply do not meet the recommended guidelines for fruit and vegetable consumption." J.N. Hall, Am J Prev Med 2009

CDC, State-Specific Trends in Fruit and Vegetable Consumption Among Adults --- United States, 2000 – 2009 and European Fresh Produce Association, April 2010.

School Meals

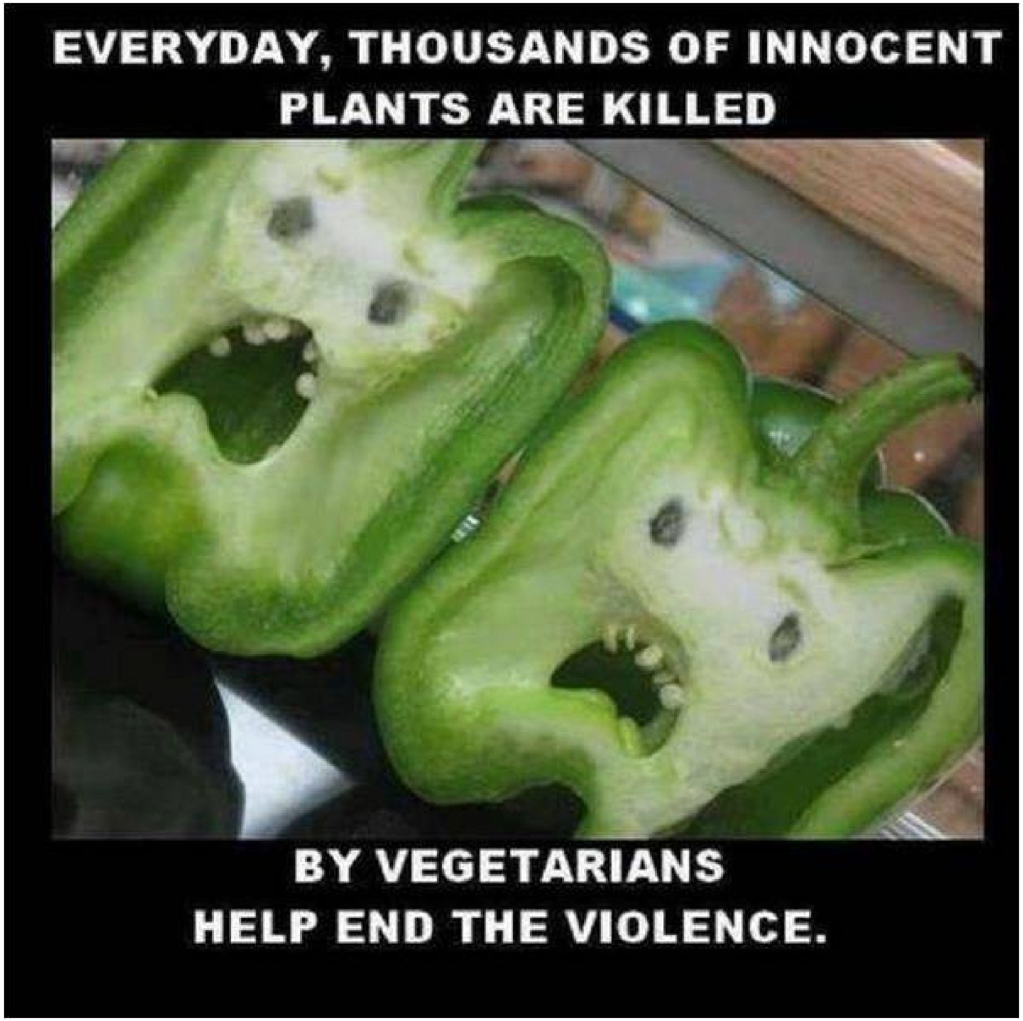
Haas *et al*	% Selected	% Waste
Entrée	100	12
Canned Fruit	53	27
Fresh Fruit	42	22
Vegetable	20	29
Monsanto	**% Unsold**	**% Waste**
Melōränge Melon	6	7
BellaFina mini-bell peppers	37	5

Haas et al., J. of Child Nutrition and Management, V.38, Issue 1, 2014

"I had a meeting with _ Public Schools today and they cannot find any affordable fresh produce. They are depending on the commodity canned fruit from the government but there is a shortage. " Sept. 2014

A success
- good agronomics
- right model and partners
- easy consumer benefit

BellaFina™
Deliciously Sweet


EVERYDAY, THOUSANDS OF INNOCENT
PLANTS ARE KILLED
BY VEGETARIANS
HELP END THE VIOLENCE.

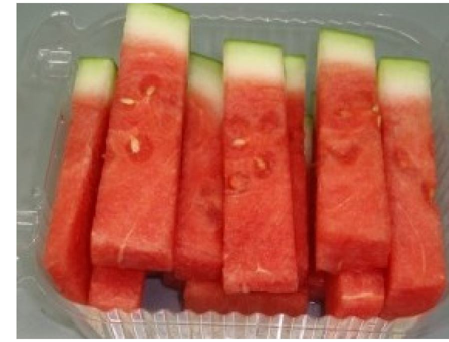
Imported Sweet

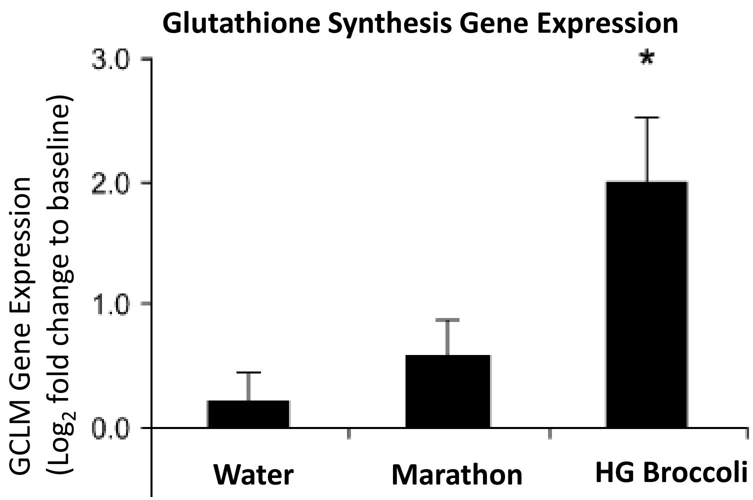
EverMild™ Sweet

summer slice™
Delight to the Last Bite

Watermelon - 7 Days After Slicing

Summerslice™ - 7 Days After Slicing

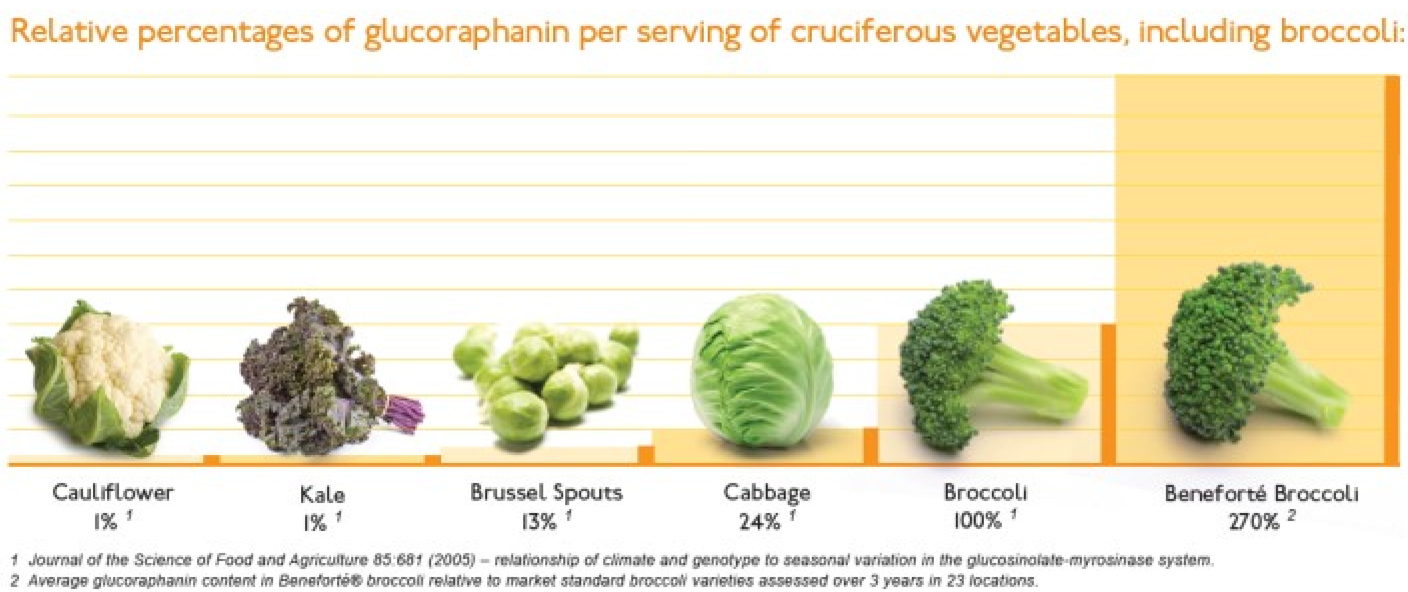




A. Gasper et al., J.Nutr., 137 (7), 1718-1724 (2007)

A tough one

- Not a recognized nutrient (RDA)
- Not an easy sound bite; health claim
- Business model
- Still promising



Vegetable Challenges

- Flavor ‘talk’; not always ‘walk’
- Grower adoption
- Buyer inertia
- Quality control
- Merchandising
- ROI

- Quality traits are difficult
- Can’t be ‘quality’ <u>or</u> agronomics
- Pursue shifts, not fads
- Set realistic expectations
- Success is possible!!!