

Challenges of the Food Industry

Toni Holenstein



Bühler Fields of Activity

Buhler – the global technology, know-how and project partner for efficient production systems, engineering solutions and associated services in the fields of

- Grain Processing
- Engineered Products
- Die Casting



Global Presence on a Local Scale

- Annual sales: 1.4 billion CHF
- Number of employees: 6100
- Over 1000 employees in the global Sales and Service Division
- Strong global organization: customized services and spare parts availability around the clock
- Present in over 140 countries
- Manufacturing sites around the world



Food

- As old as mankind
- Slow innovation by trial and error
- Industry since 19th century
- Rapid development in recent years only
- High potentials for future developments



*Woman grinding grain,
Limestone, about 2500B.C.*

Food

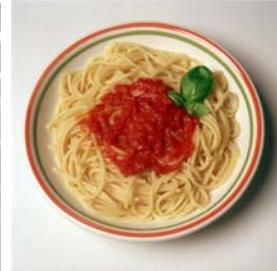
- As old as mankind
- Slow innovation by trial and error
- Industry since 19th century
- Rapid development in recent years only
- High potentials for future developments



*Böhler Mill,
about 1910*

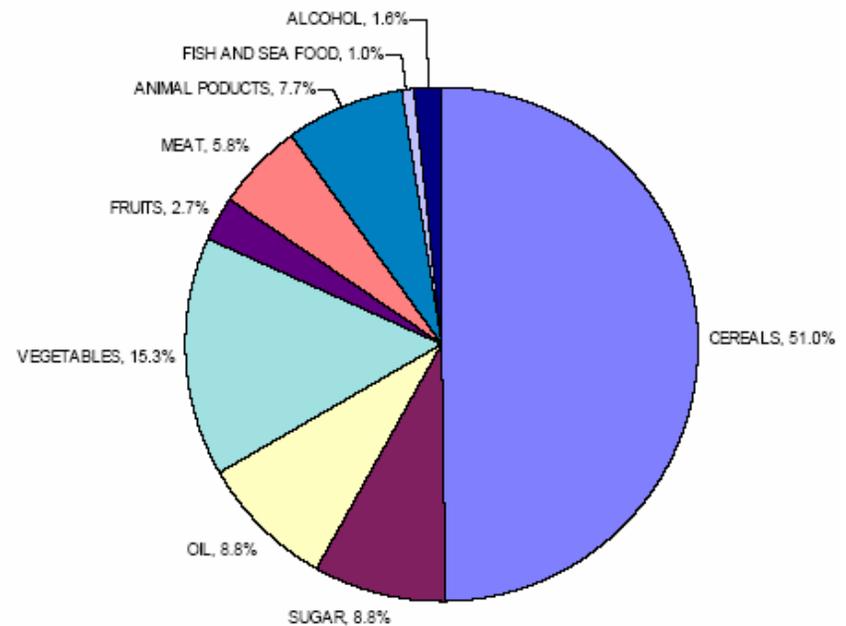
Challenges of the Industry

- Supply of quantities needed
- Preservation and distribution
- Safety and health
- Meeting new requirements



Worldwide food supply

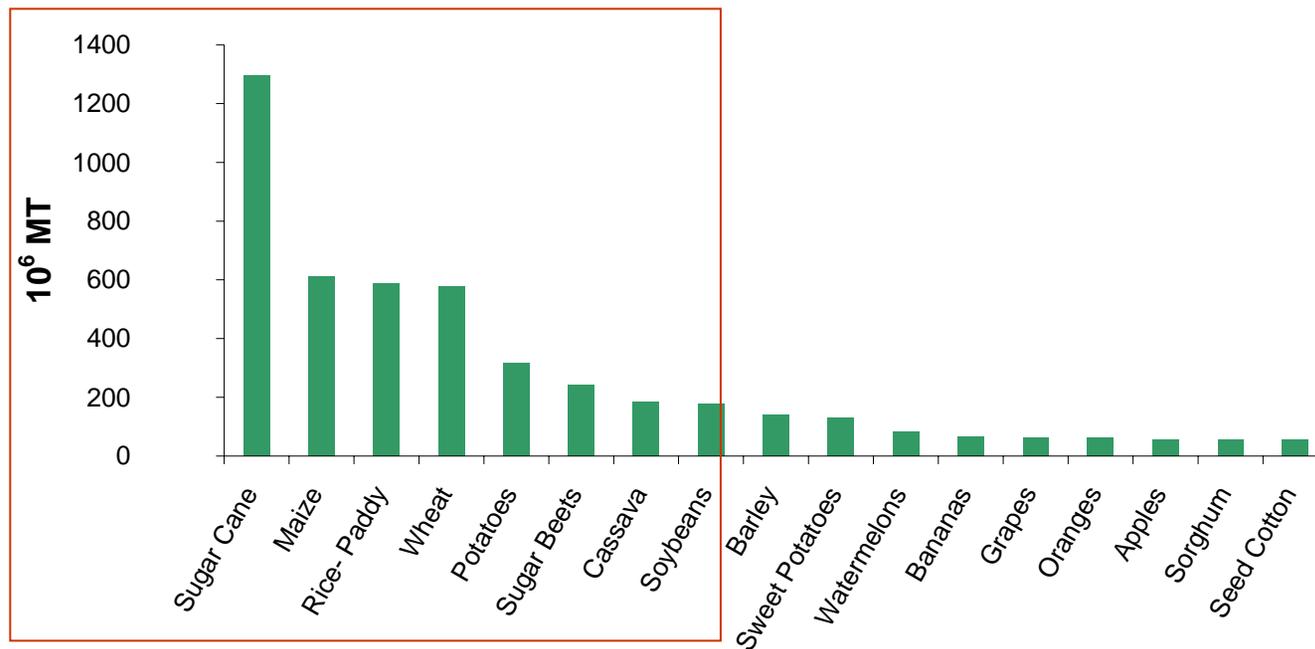
- Cereals > 50% of total food supply



Worldwide food supply

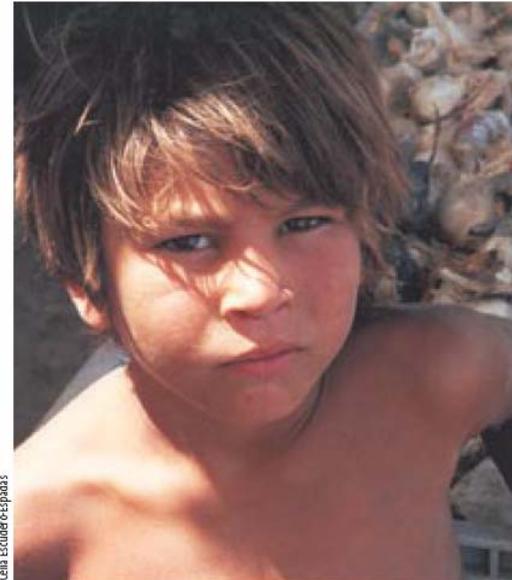
- Few edible plants are used

World Production
(Yearly prod. average 2000-2003)
(Source: FAOSTAT data, 2004)



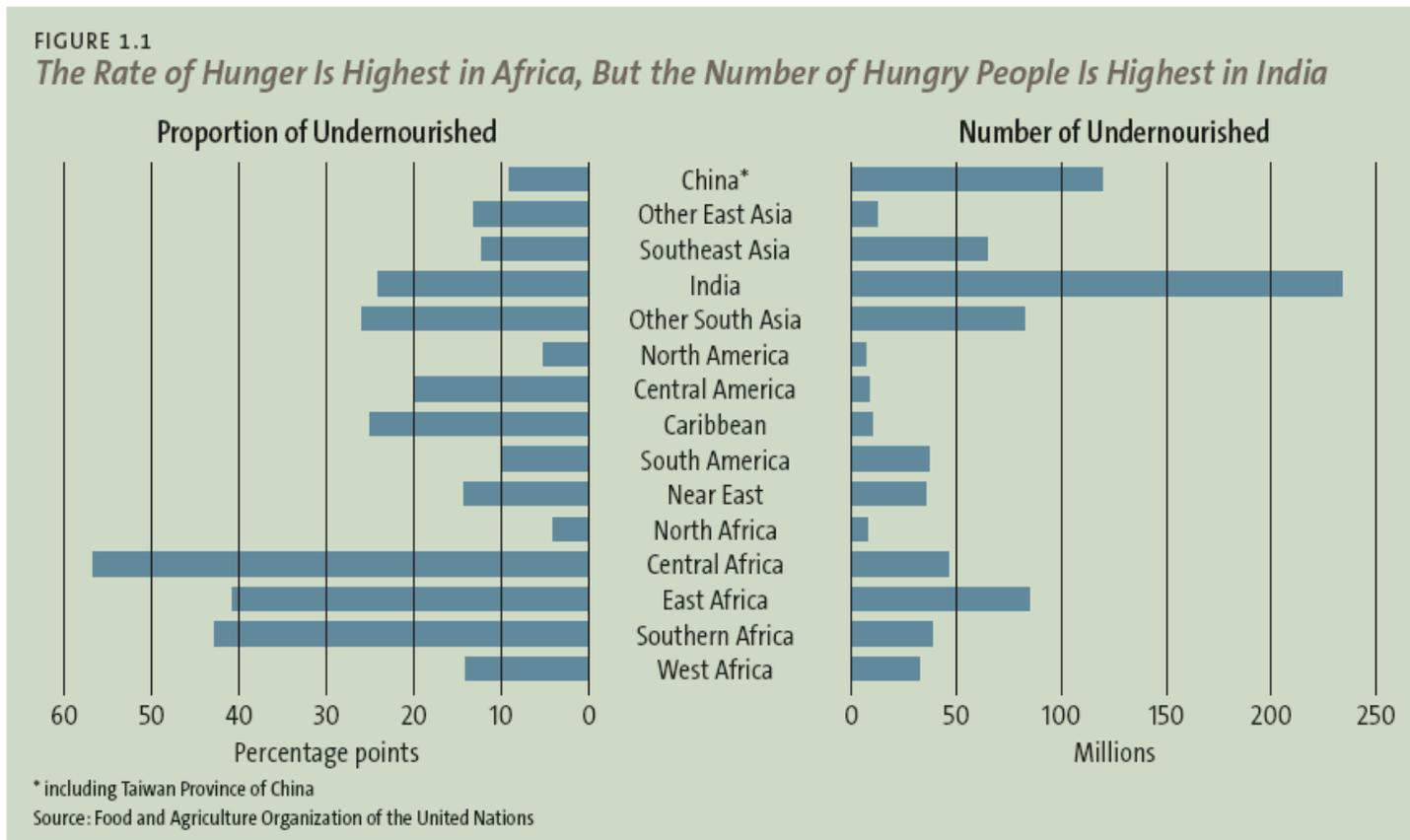
Worldwide food supply

- Hunger still an important issue
- 800 Million people suffer from hunger
- Every minute about 11 children younger than 5 years dying of hunger-related causes!



Worldwide food supply

- Hunger still an important issue



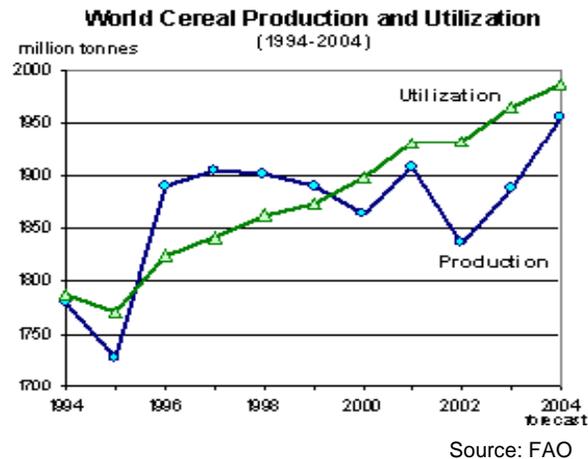
Worldwide food supply

- Abundant food available
- Even in the future
- Distribution heavily dependent on global imbalances, politics, conflicts and wars.



Preservation and Transportation

- 42% preharvest losses (Orke et al. 1994).
- 10% postharvest losses
- Crop variations



Preservation and Transportation

- 1000 kg of Water per 1kg of wheat
- Shipping cereals means virtual water flow (saving resources)

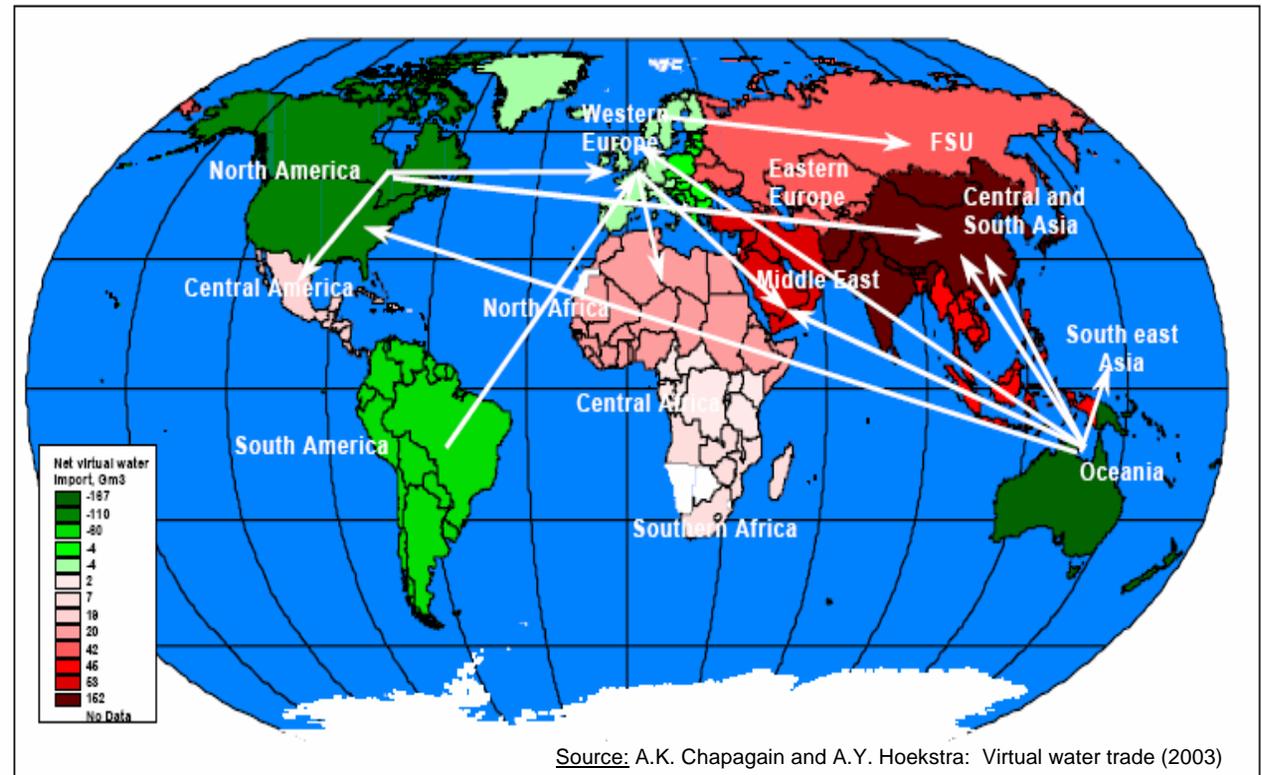


Figure 5.3. Virtual water trade balances of thirteen world regions related to the trade of livestock and livestock products. Period: 1995-1999. Green coloured regions have net virtual water export; red coloured regions have net virtual water import. The arrows show the largest net virtual water flows between regions greater than $>10 \text{ Gm}^3$.

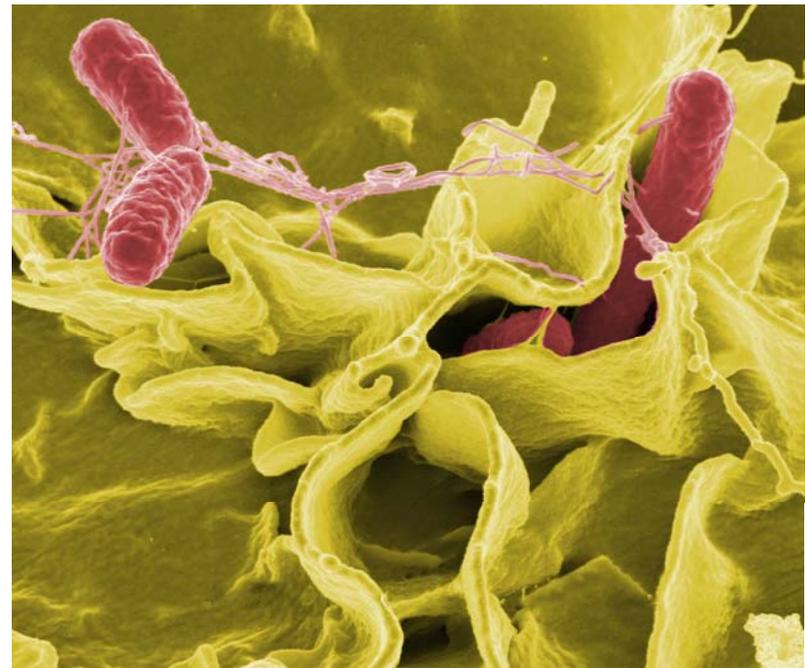
Safety and Health

- Pure food and drugs act 1906
- Sanitation, Pasteurization, Refrigeration, testing cows for tuberculosis,...



Safety and Health

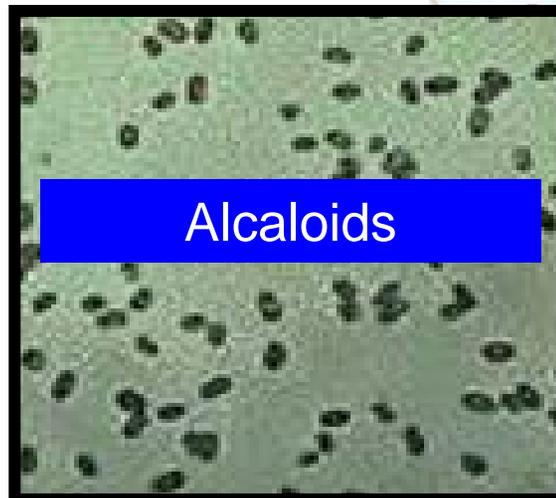
- Still an important issue
- E.g.:
 - Wheat peeling and cleaning
 - Thermal treatment of animal feed



Salmonella Typhimurium (Rocky Mountain Lab.)

Safety and Health

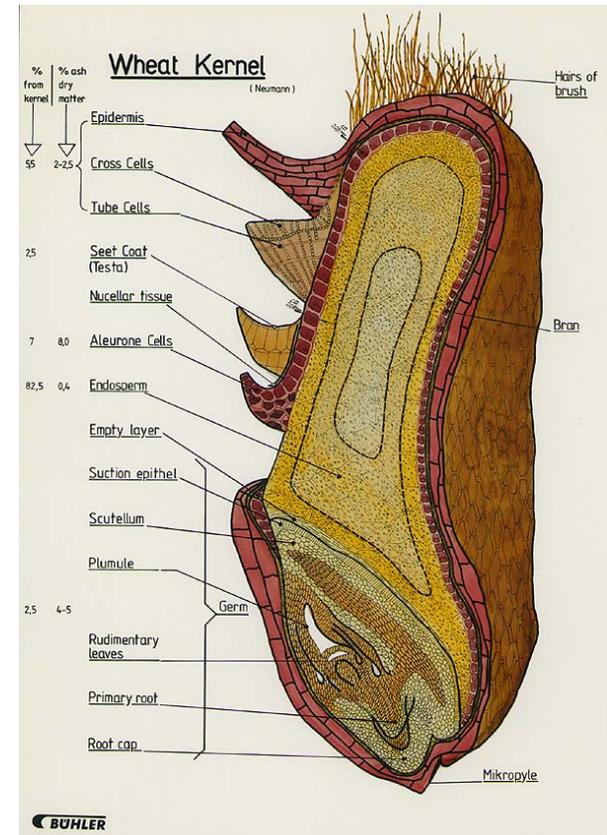
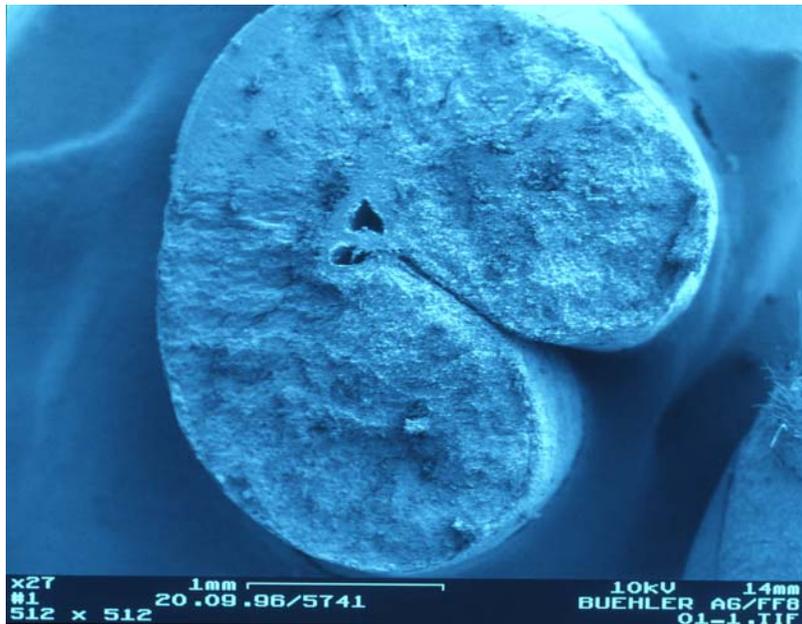
- Ergot:
Fatal dose rate 5 grams!
(containing LSD)



Claviceps

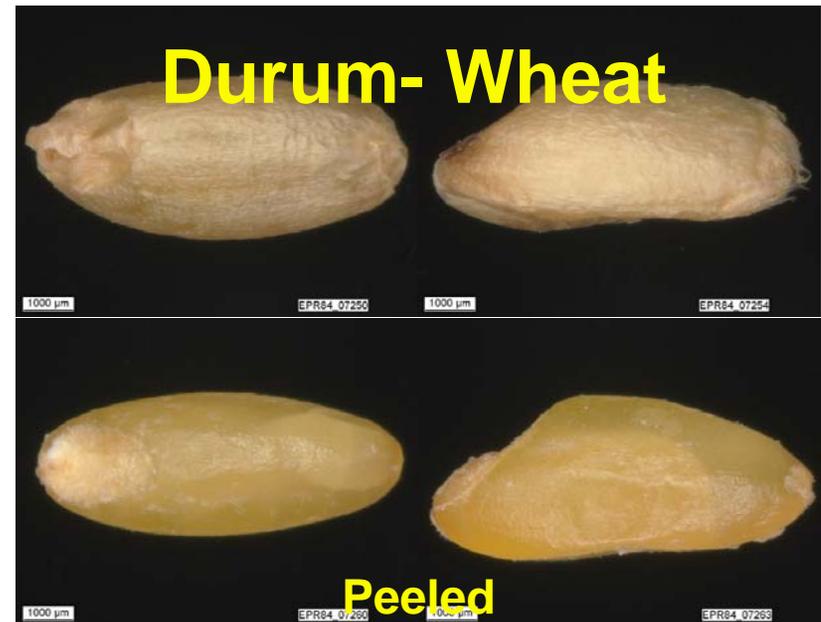
Safety and Health

- Wheat grain quite tricky



Safety and Health

- New cleaning, peeling and sorting technologies for safer food



New Challenges

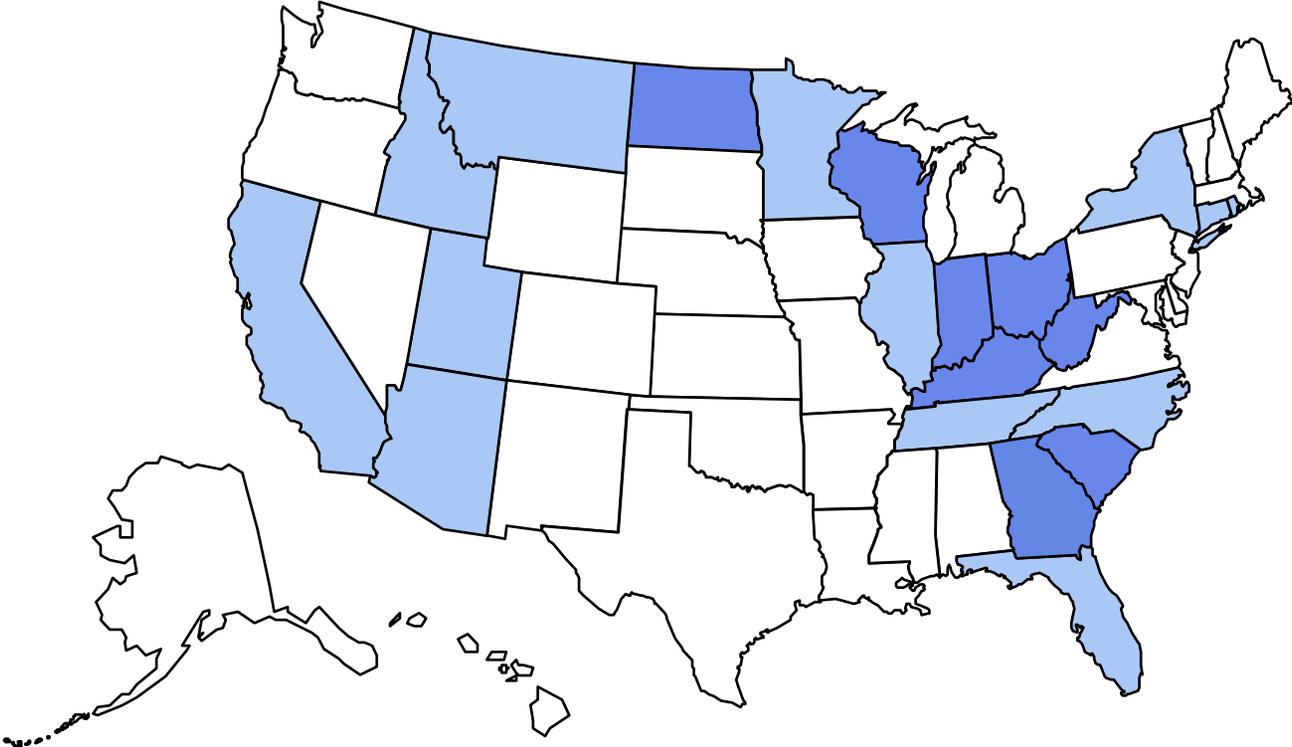
- Obesity
- Diabetes II
- Coronary Heart Disease



Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" woman)

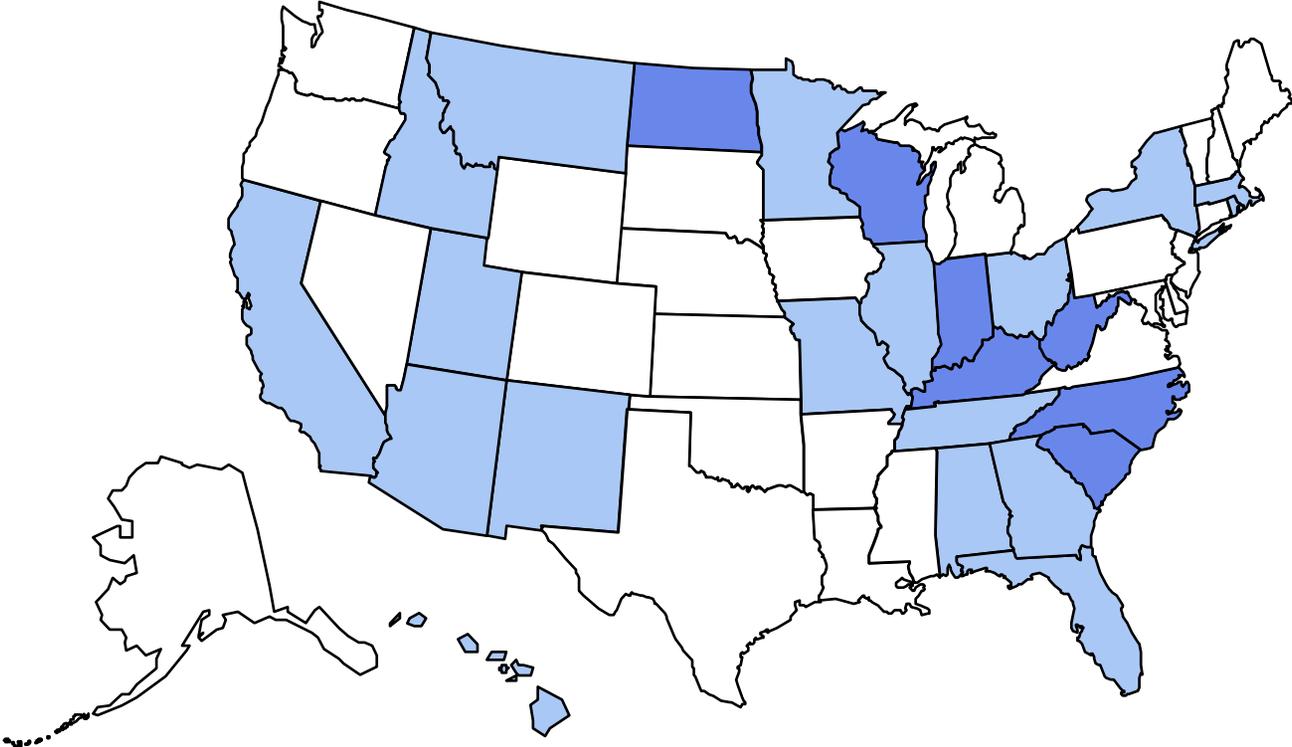


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1986

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" woman)

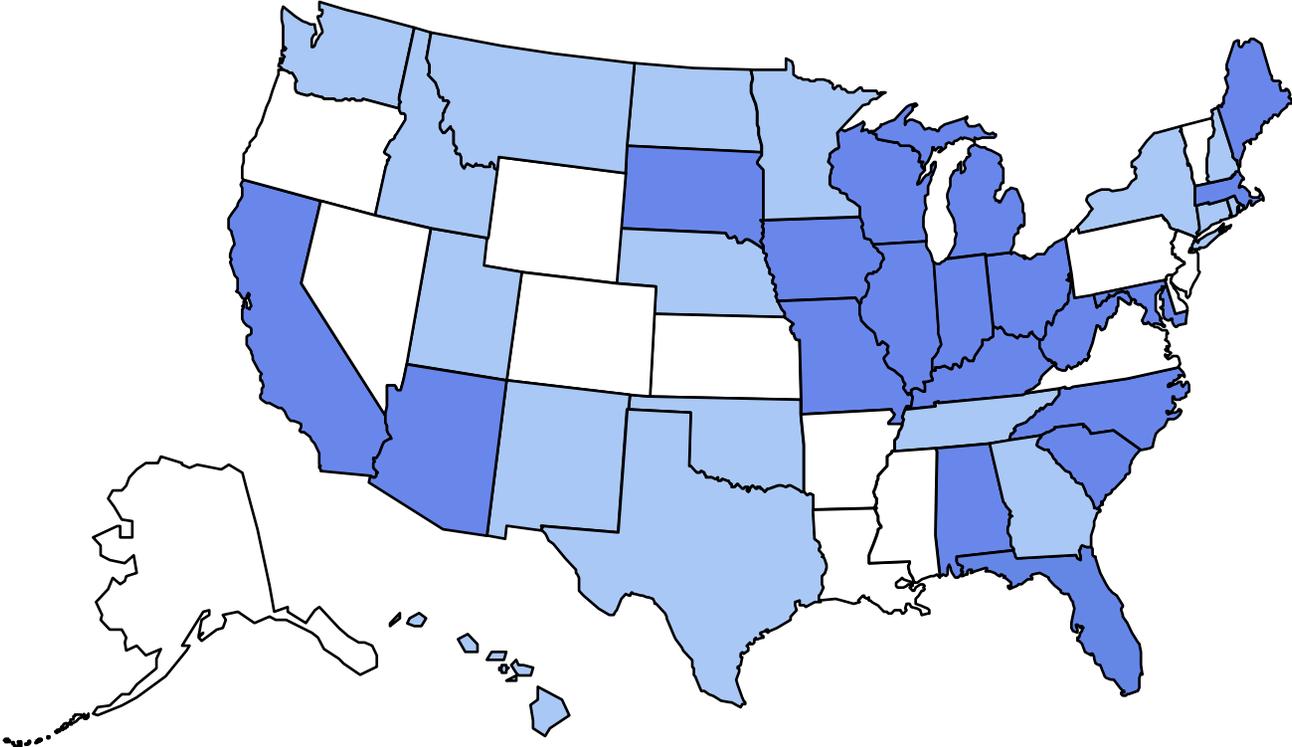


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1988

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

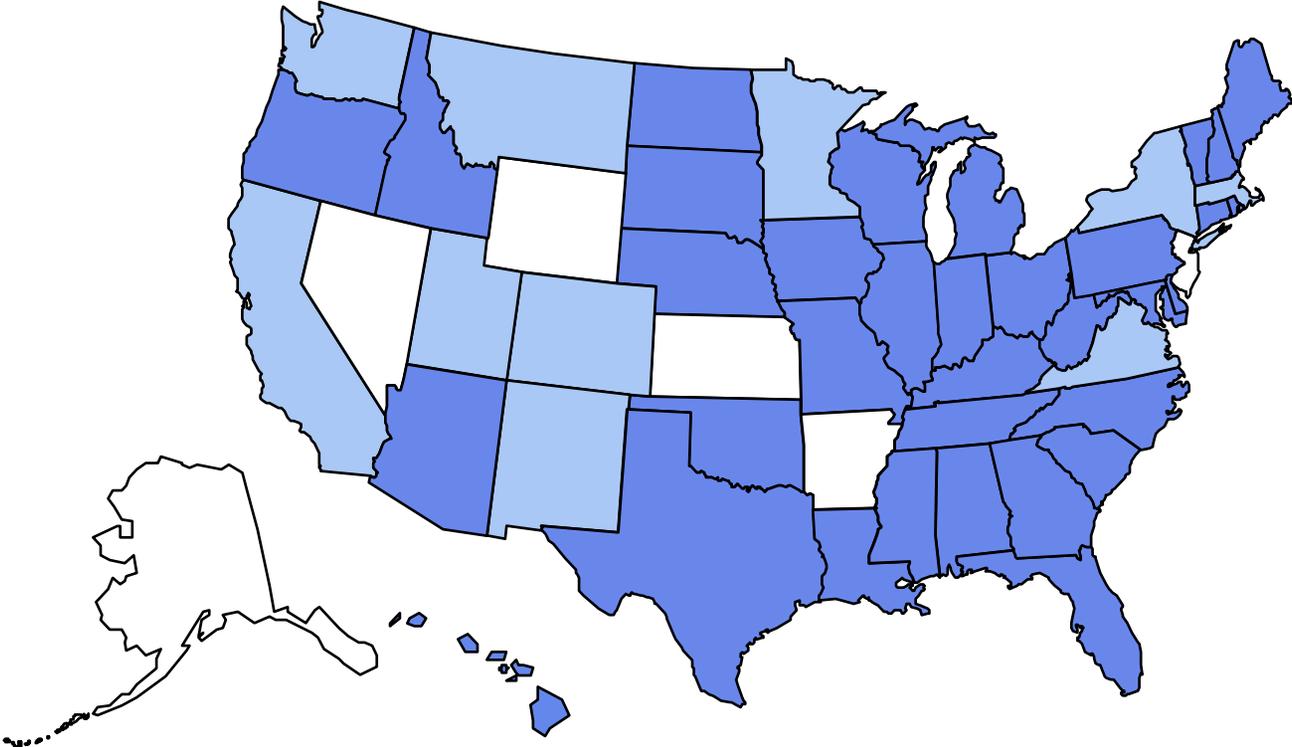


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" woman)

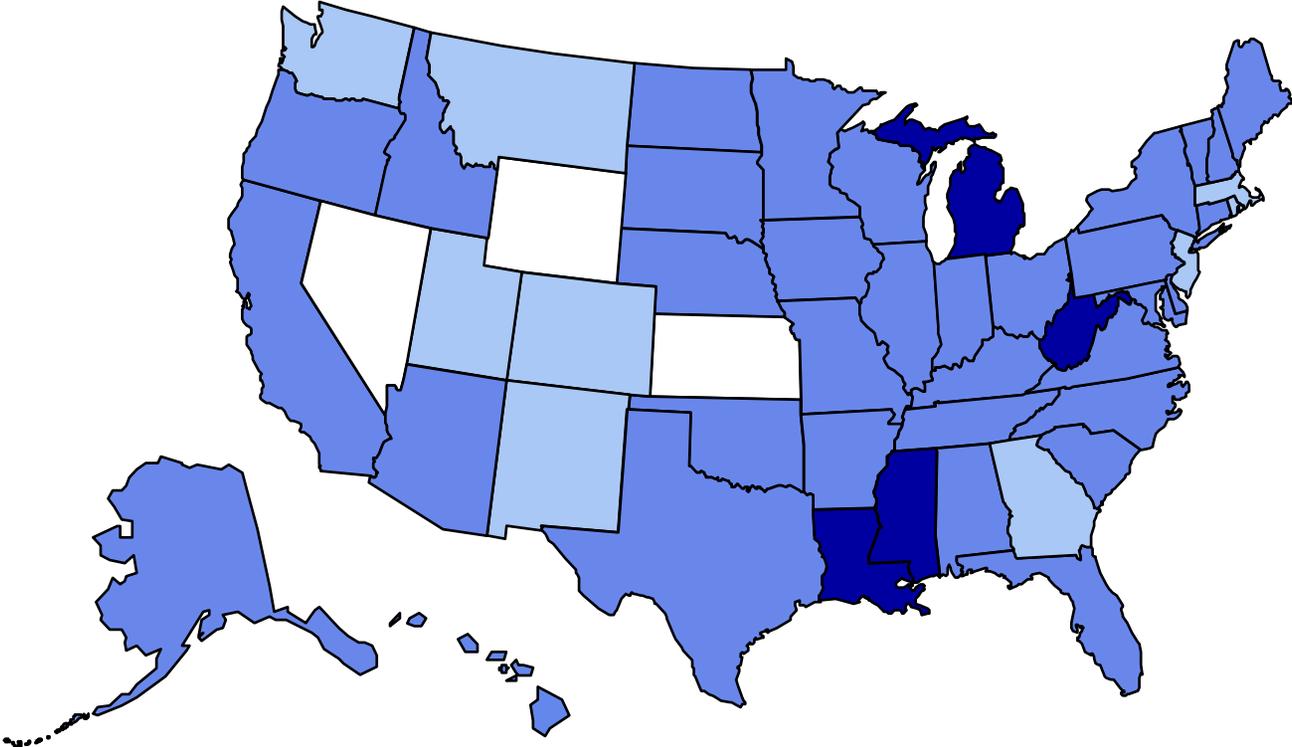


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1991

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

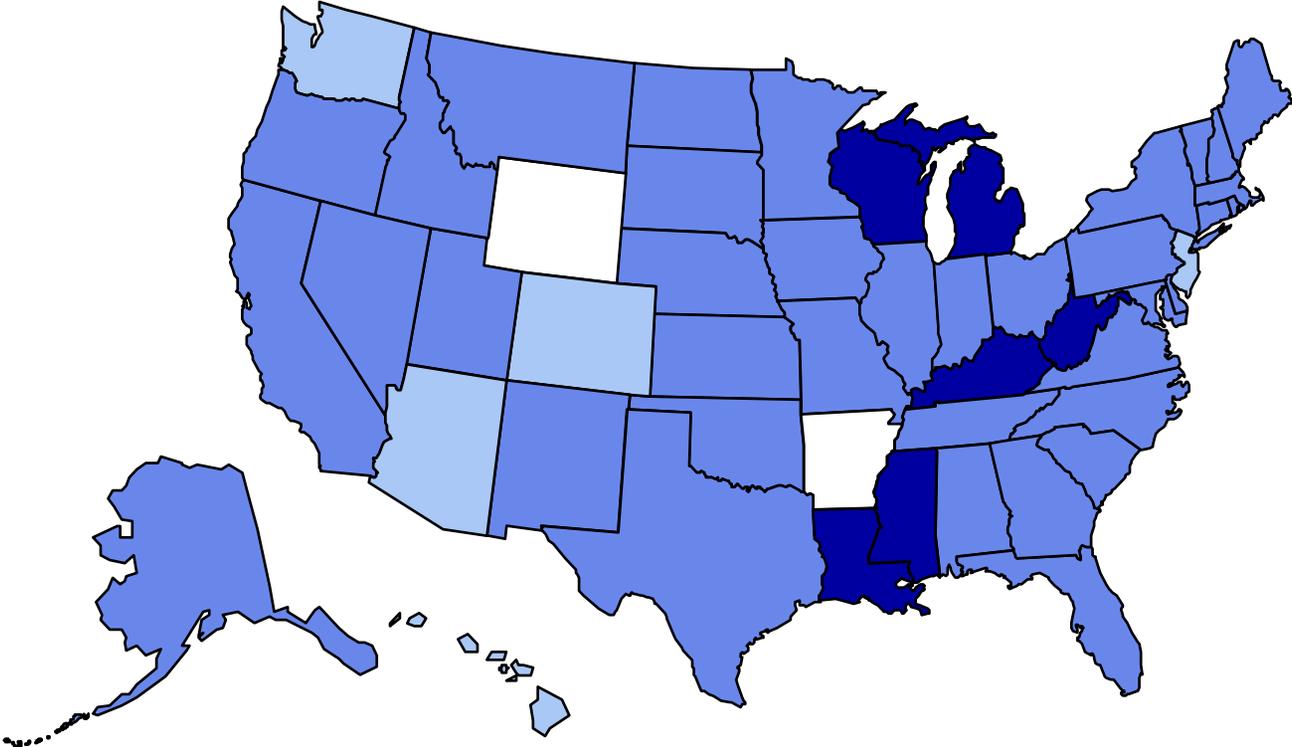


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1992

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

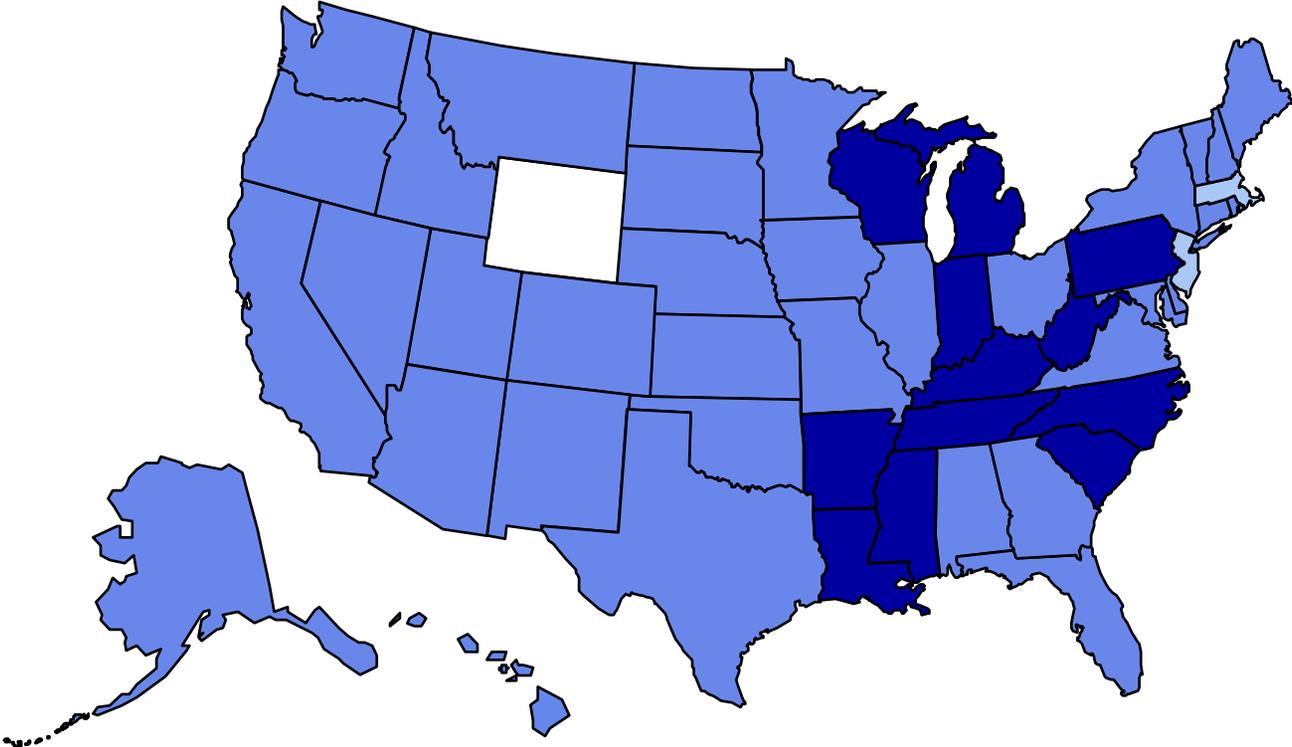


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1993

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

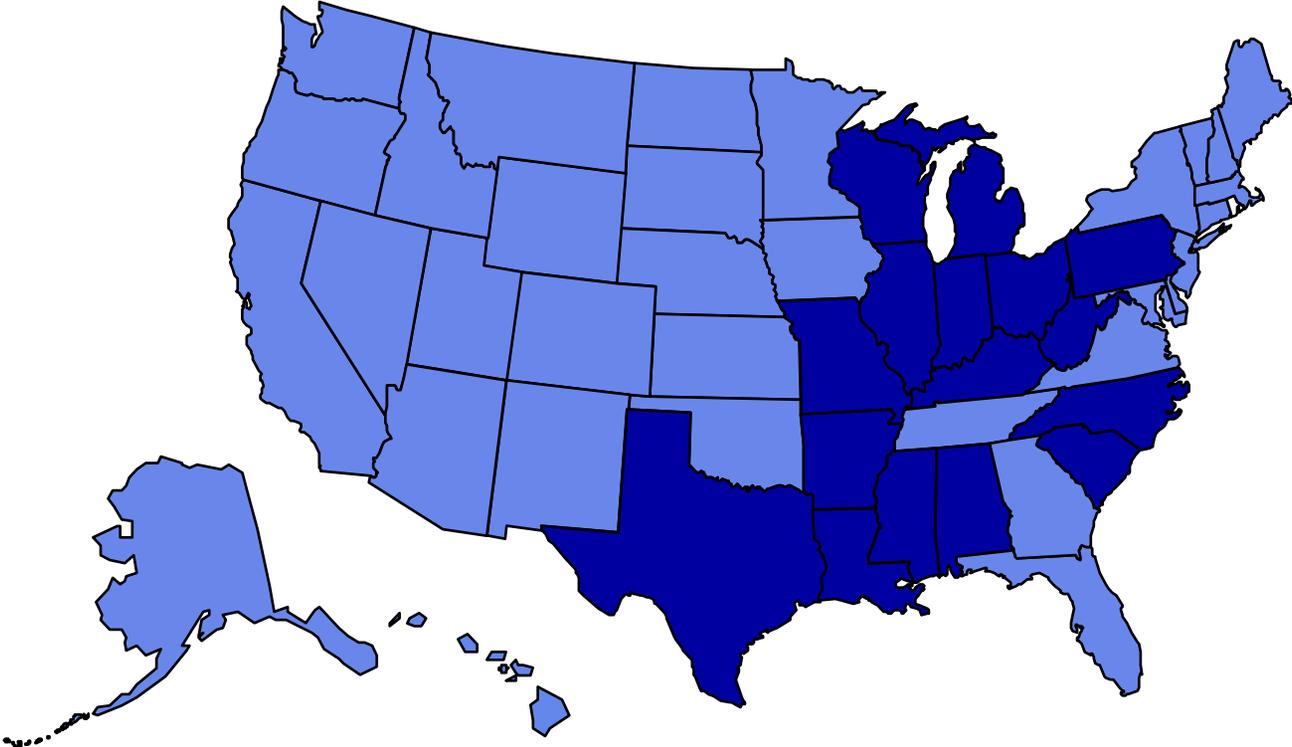


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1994

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

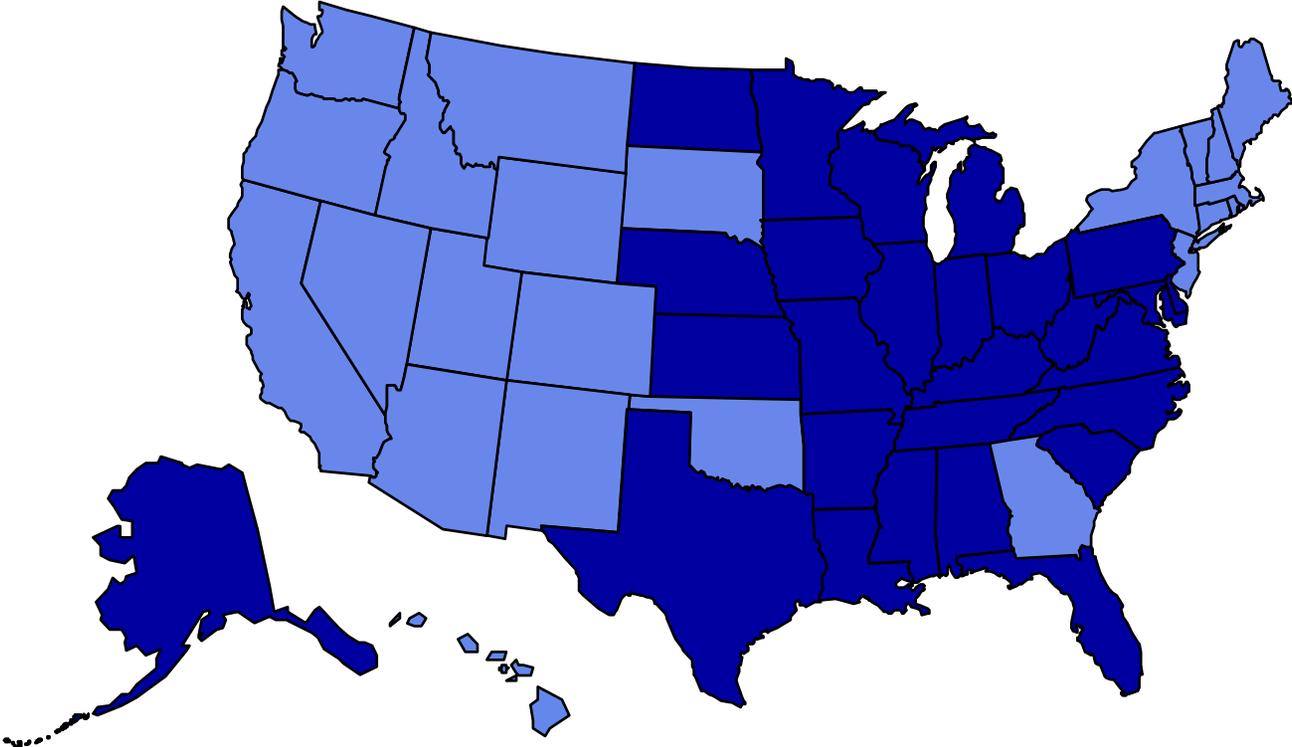


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1995

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

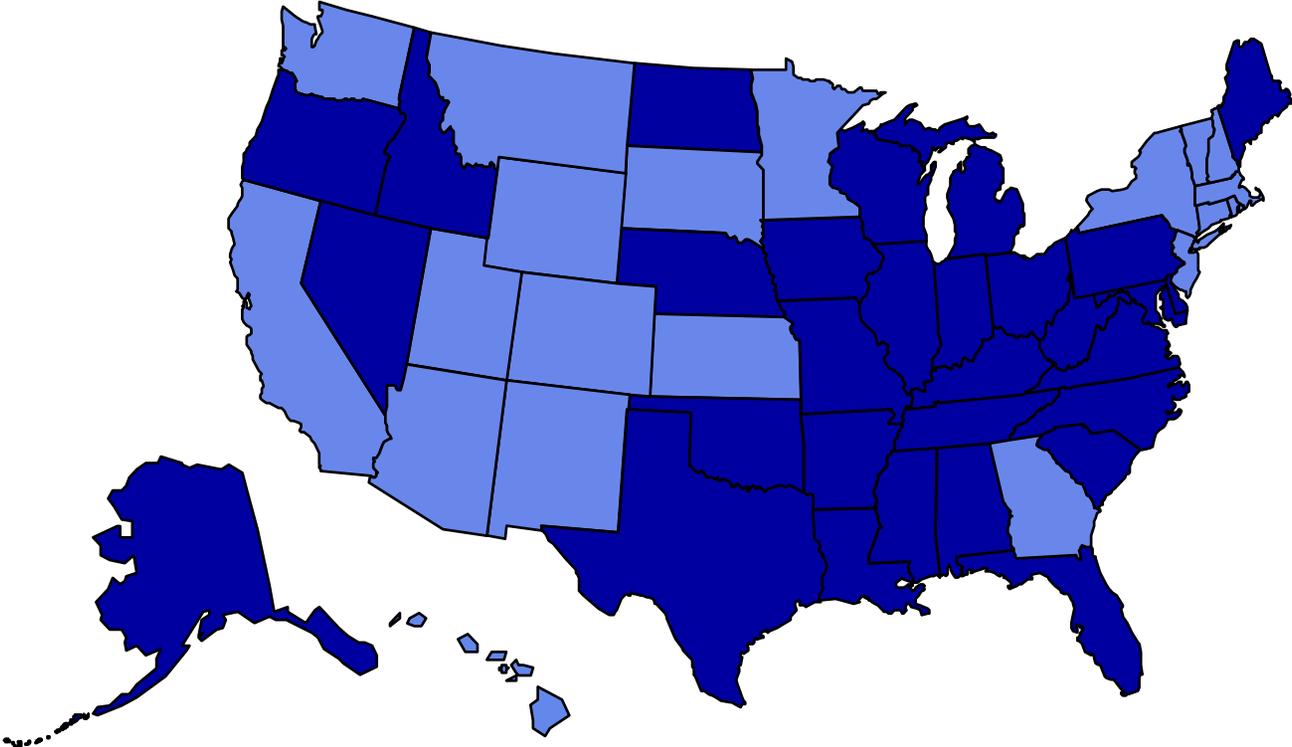


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1996

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

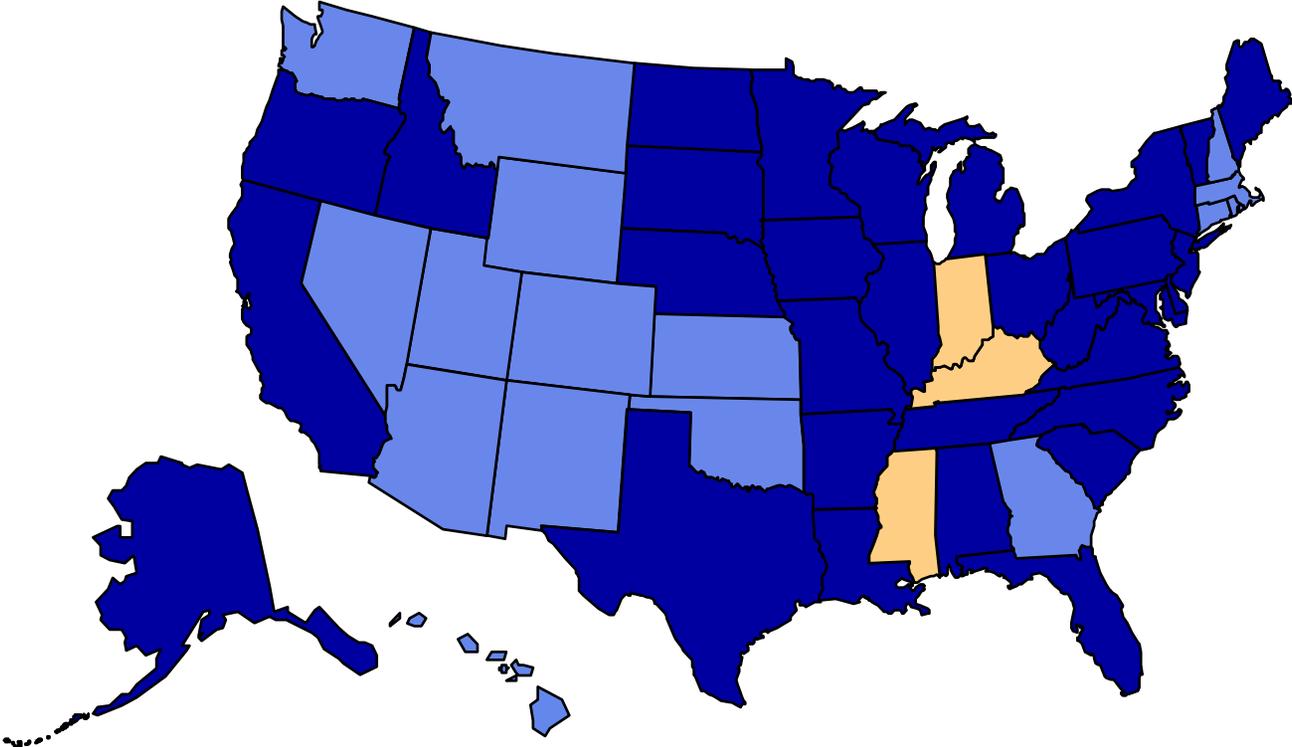


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1997

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

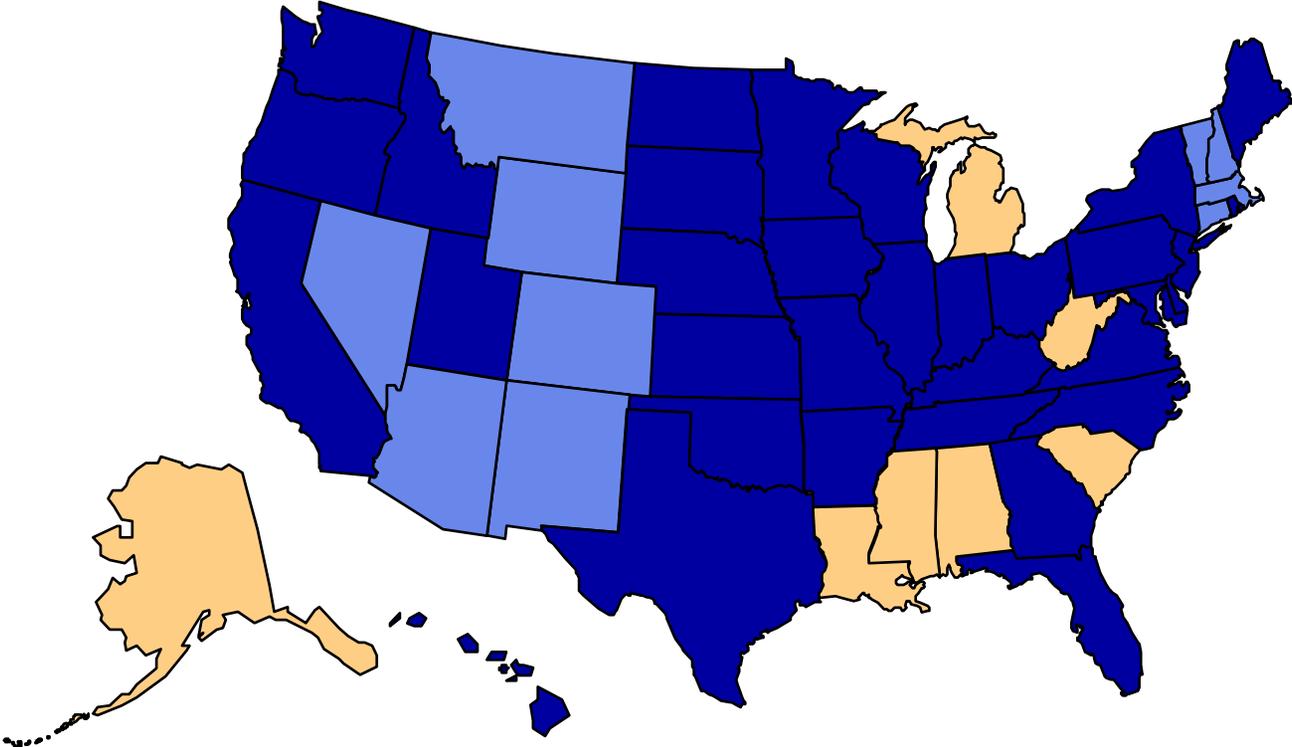


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1998

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

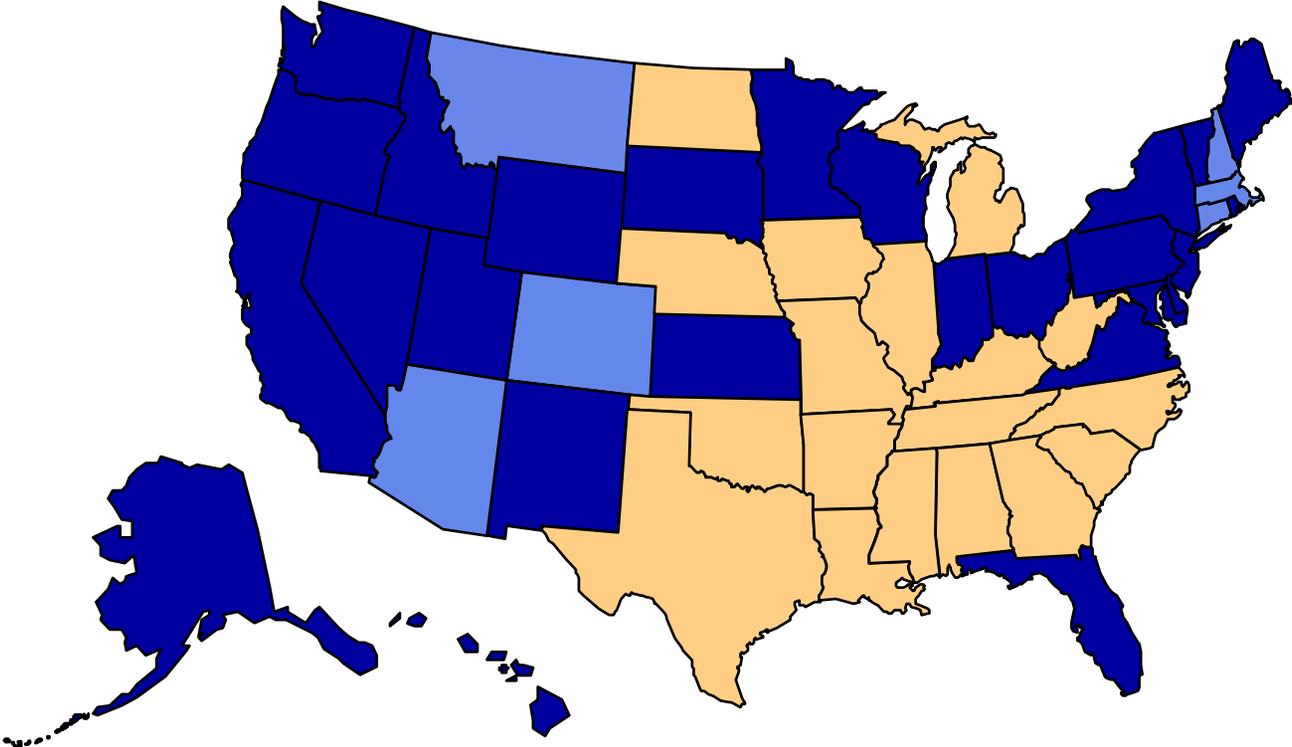


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 1999

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)

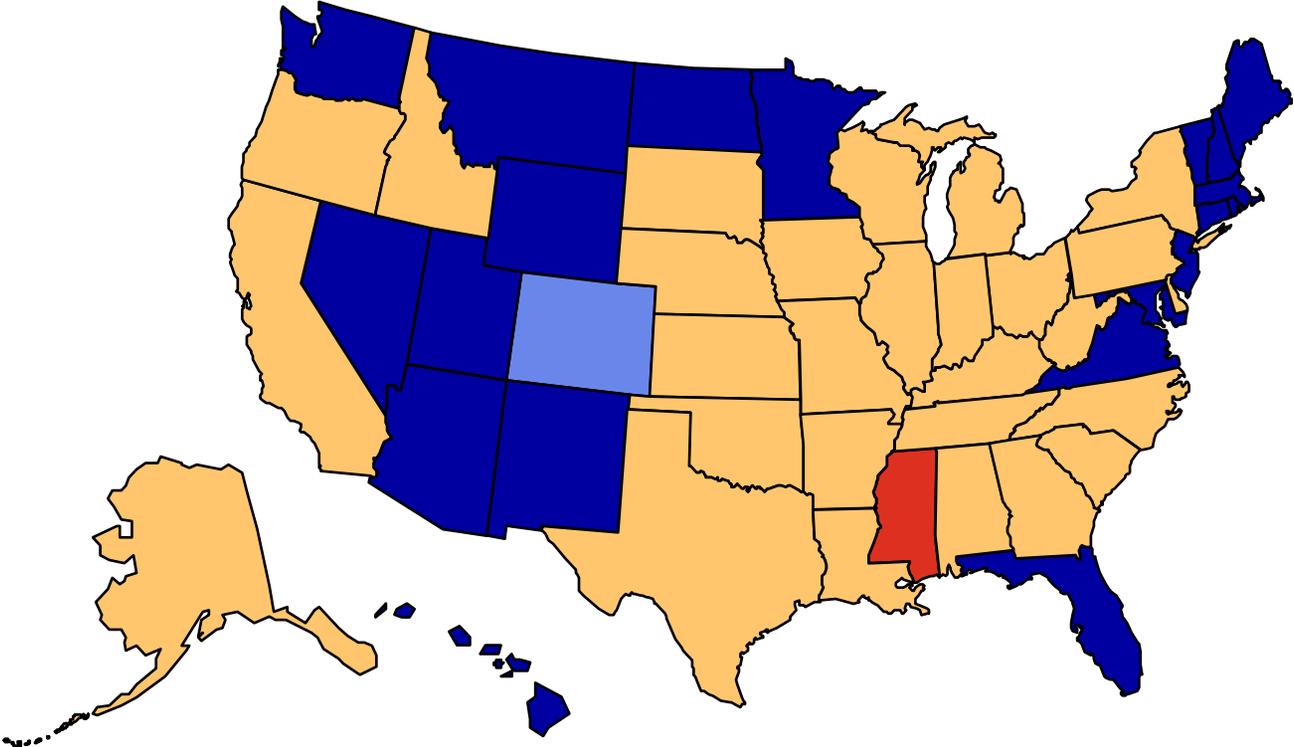


Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults

BRFSS, 2001

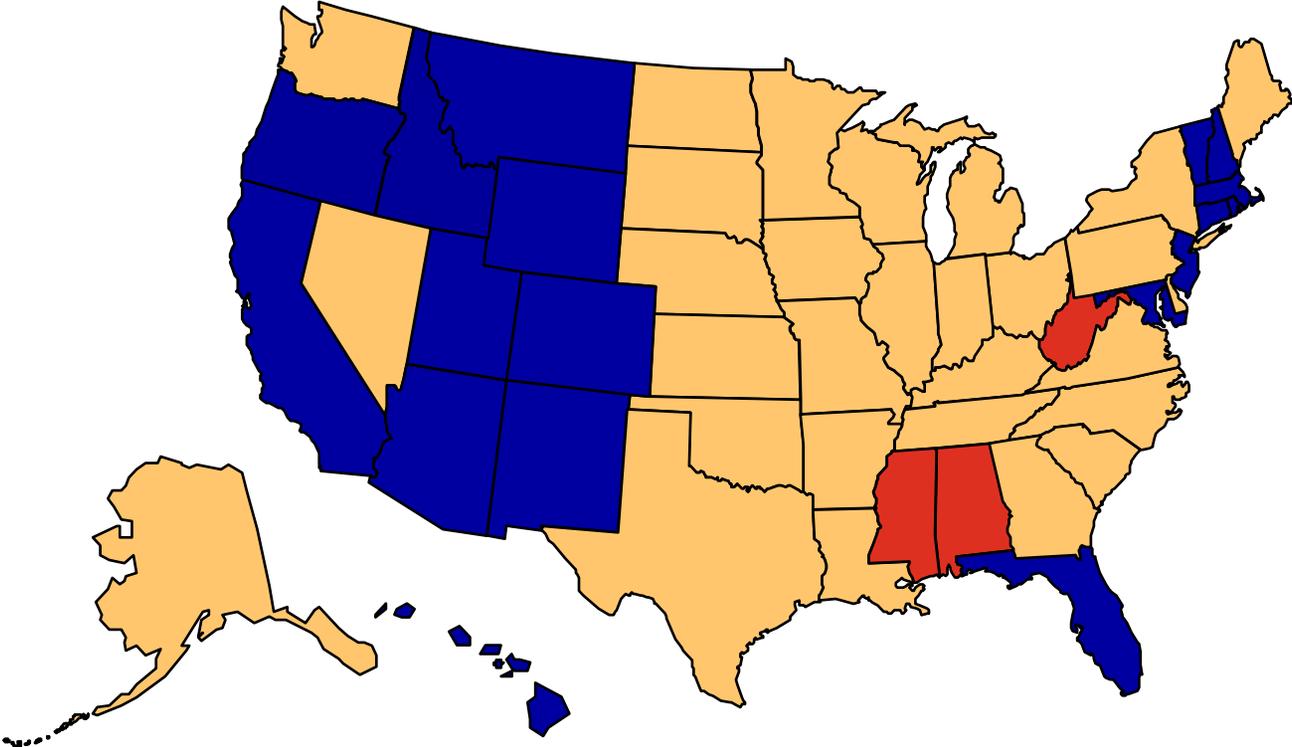
(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)



Source: Behavioral Risk Factor Surveillance System, CDC

Obesity Trends* Among U.S. Adults BRFSS, 2002

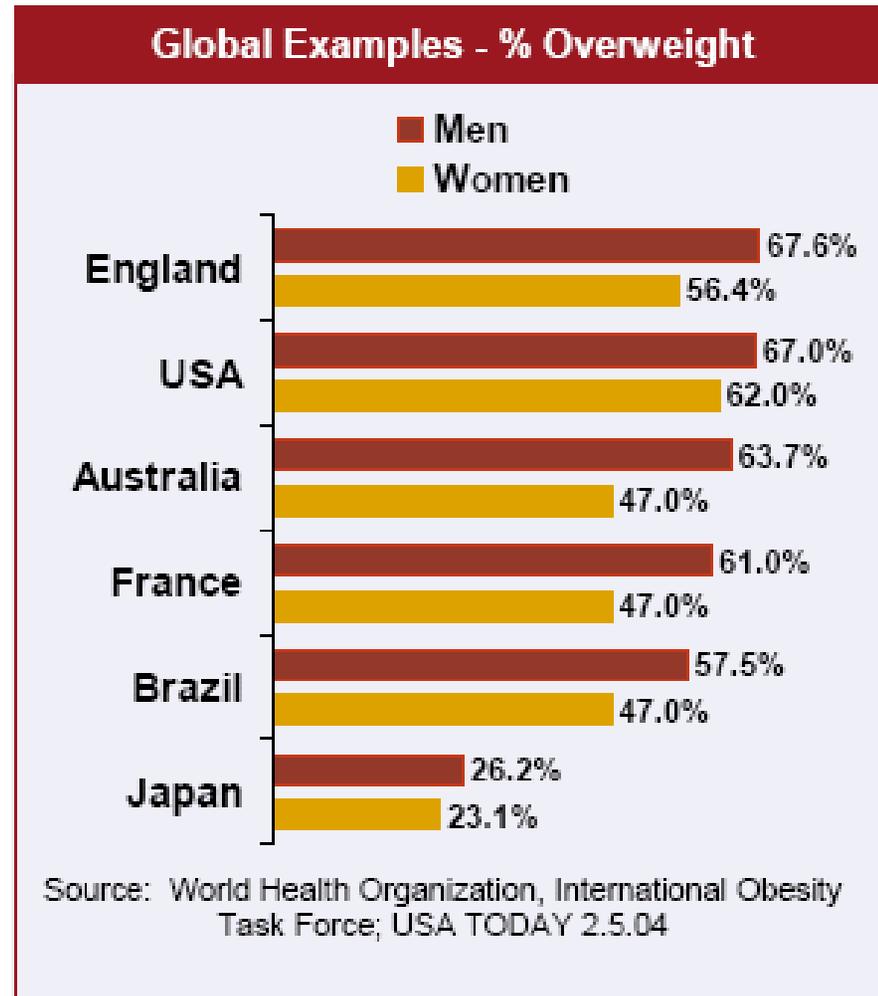
(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" woman)



Source: Behavioral Risk Factor Surveillance System, CDC

New Challenges

Overweight (BMI > 25)
A global problem



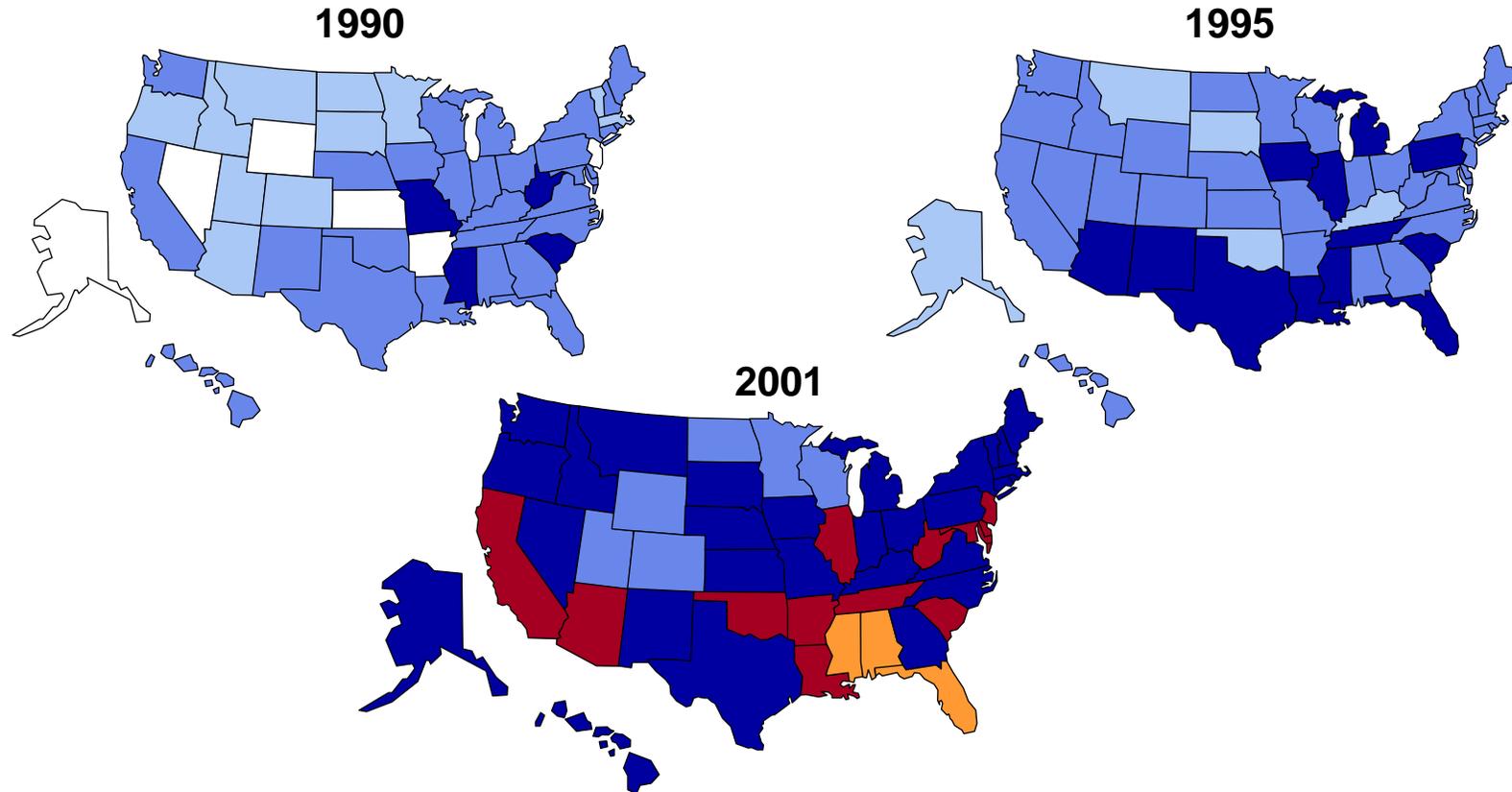
New Challenges

Percentage of 10-year-olds overweight or obese, 2002

Italy:	36%
Greece:	31%
Spain:	30%
United States:	25%
Britain:	22%
France:	17%
Germany:	15%
Netherlands:	14%

New Challenges

Diabetes Trends* Among Adults in the U.S.,
(Includes Gestational Diabetes)

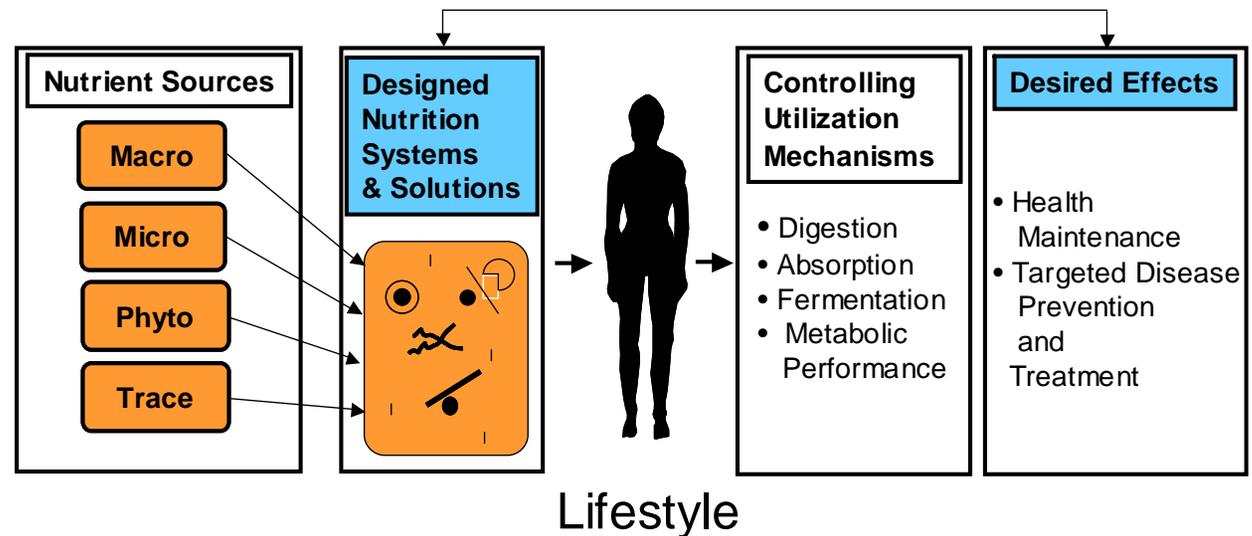
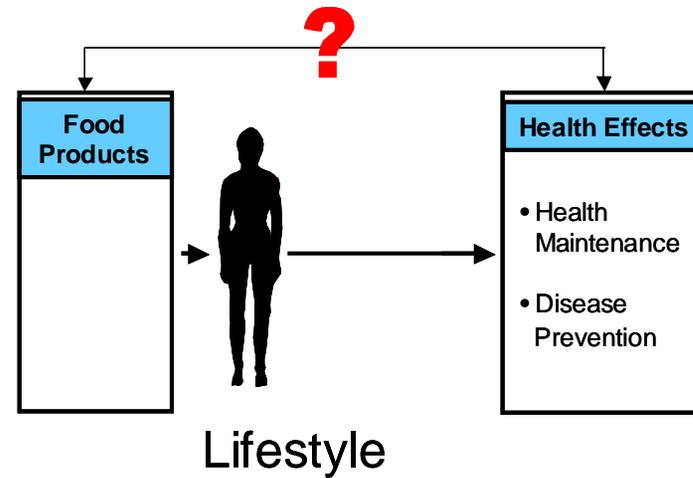


Source: Mokdad et al., *Diabetes Care* 2000;23:1278-83; *J Am Med Assoc* 2001;286:10.

New Challenges

Understanding Nutrition

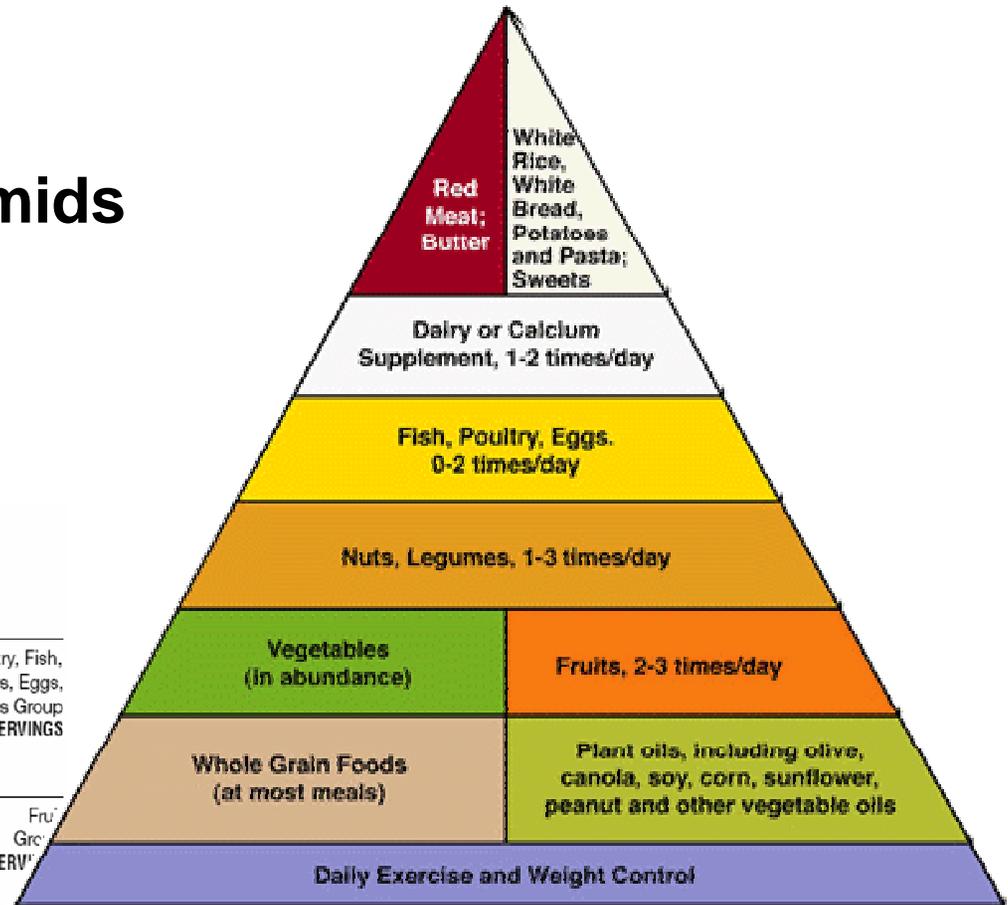
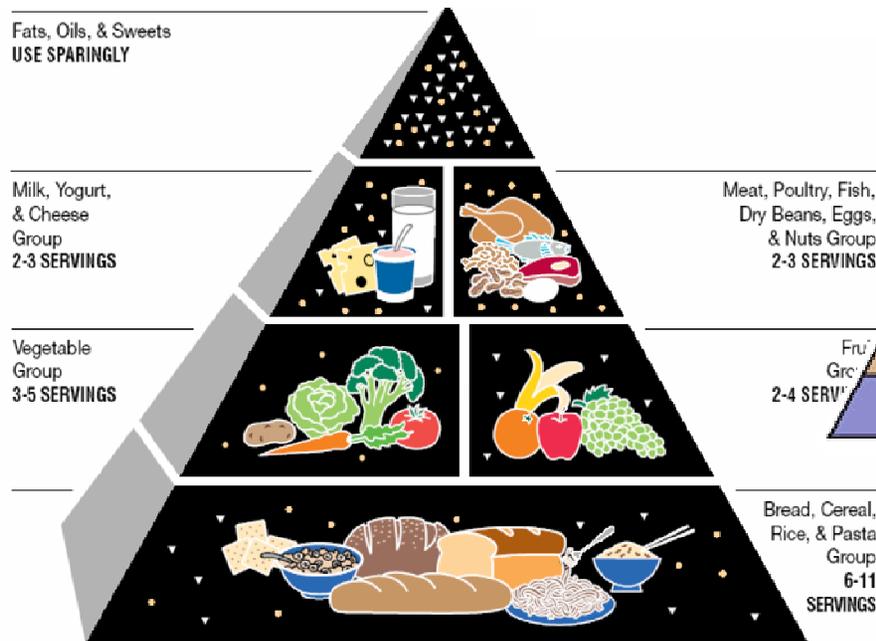
Better understanding of health effects of components and food compositions



New Challenges

Changing the Food Pyramids

USDA Food Pyramid



Healthy Eating Pyramid

New Challenges

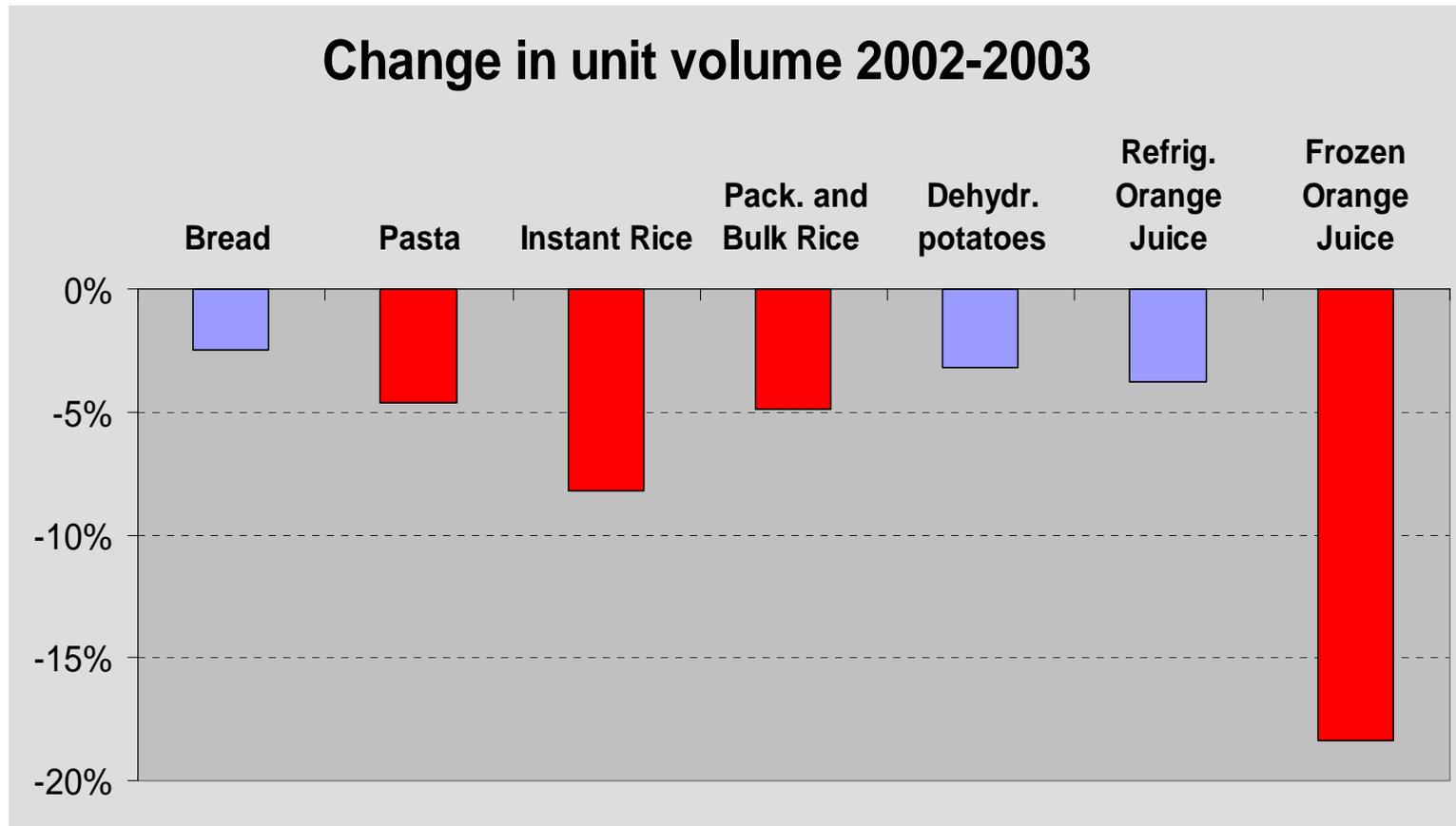
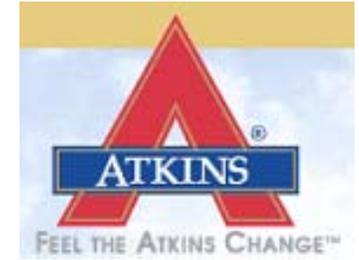
New requirements - Healthier Lifestyle

- more conscious people
- strong consumer trend leading to a healthier lifestyle
- a new vocabulary becoming more and more popular:
 - Body Mass Index**
 - Glycemic Index (GI), Glycemic Load (GL)**
 - Low Carb, Healthy Eating Index (HEI)**
- new food designs required to meet new demands



New Challenges

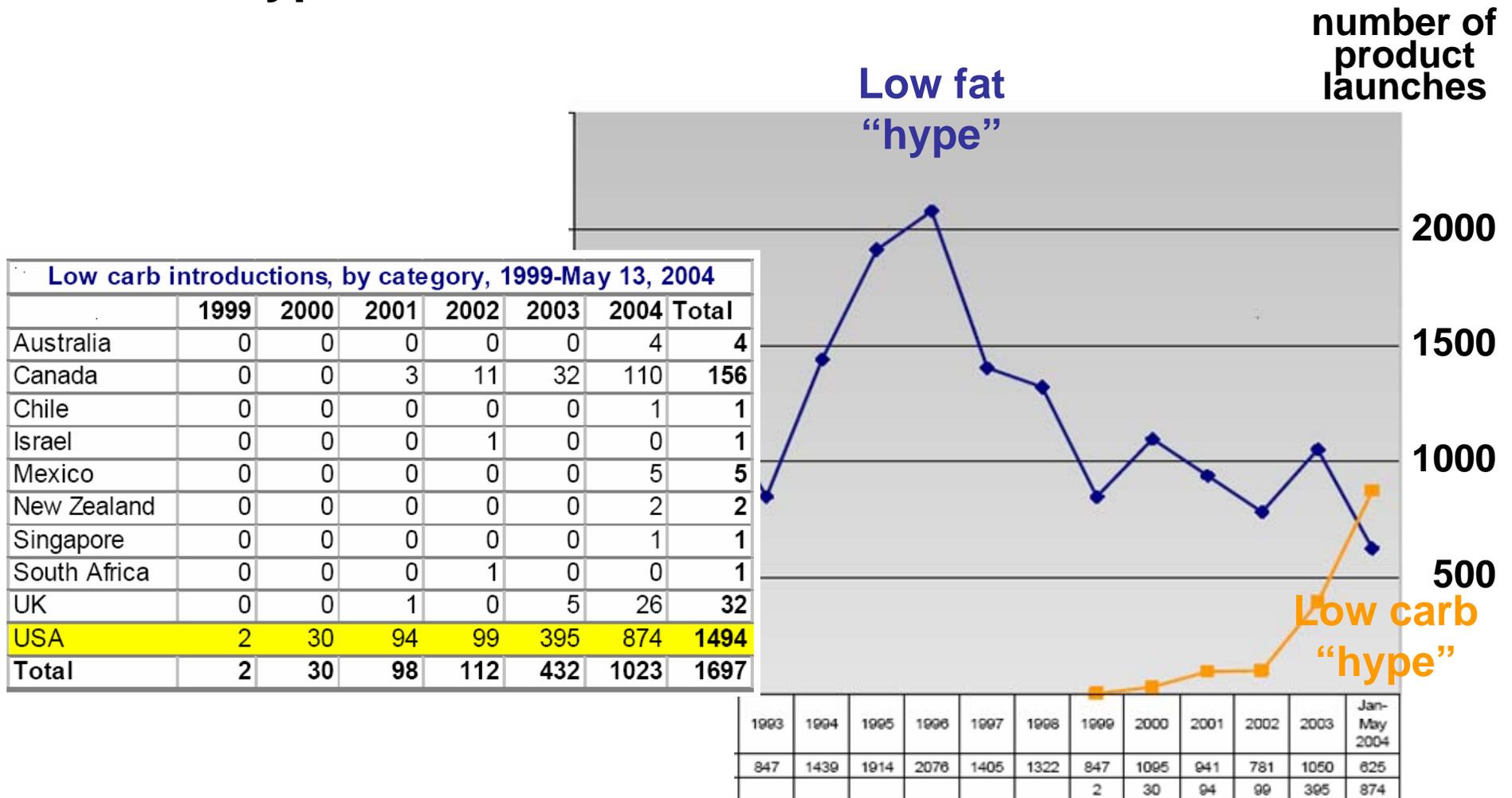
Sales of starchy foods have dropped off in USA



Source: BakingBusiness.com, The Houston Chronicle January 23, 2004

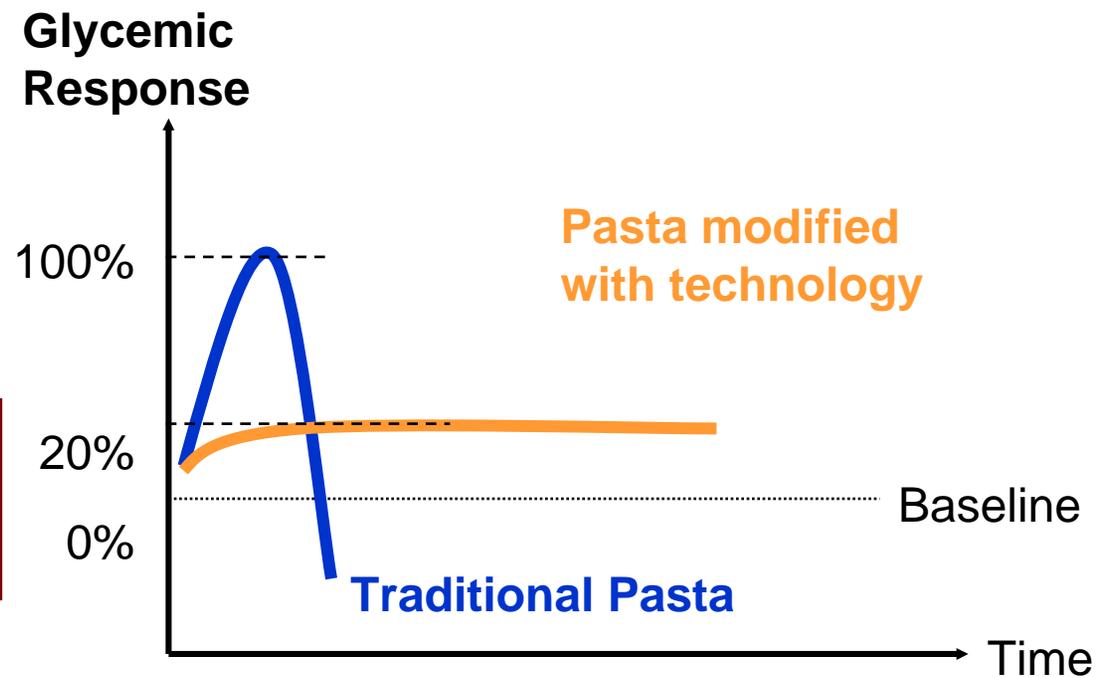
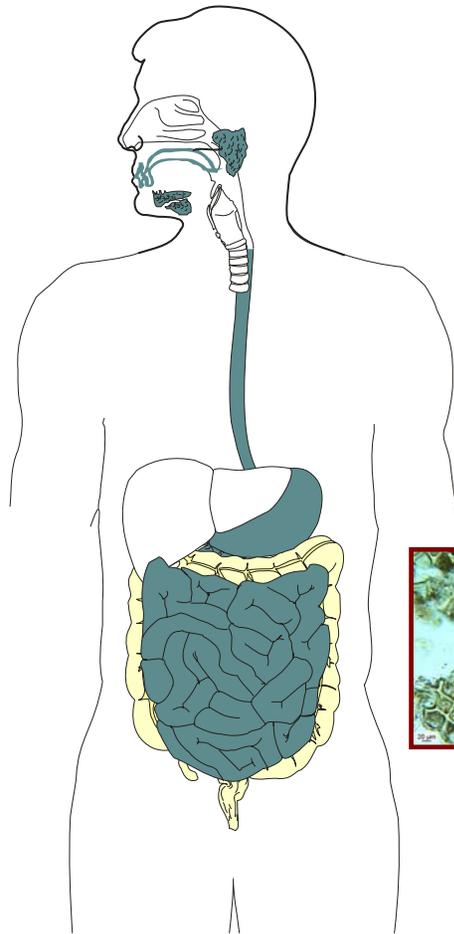
New Challenges

Diet „Hypes“



New Challenges

Understand the process: e.g. Glycemic response



Carbmazing

grams

5



*Authentic Pasta Taste. 5 grams of Carbs**

Now you can eat the pasta you love, while controlling your carbs. New Dreamfields is authentic pasta made with premium durum semolina, without soy fillers like most "low carb" pastas, and only 5 grams of digestible carbs per serving. With Dreamfields, watching your carbs doesn't mean sacrificing taste. It's the pasta your whole family will love. Guaranteed.

Pasta Serving Facts	Dreamfields Pasta	Standard Pasta
*Digestible Carbohydrates	5 grams	32-40 grams

Available in the pasta aisle

www.dreamfieldsfoods.com