



# ***AQUACULTURE OUTLOOK***

Role of Aquaculture in Meeting Global Seafood Demand  
Seattle, Washington – June 20, 2005

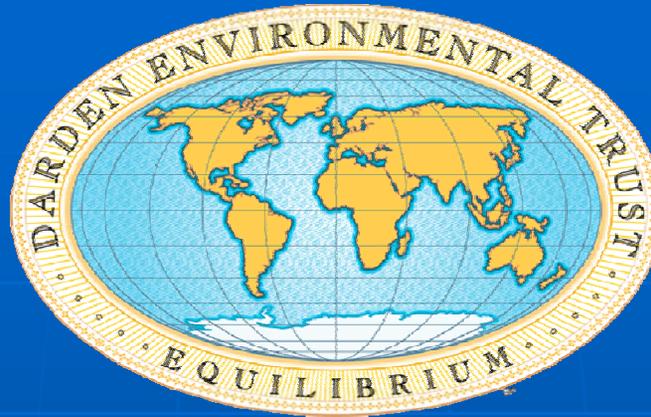
**MICHAEL KARPPE**

**DARDEN**  
RESTAURANTS



# AGENDA

- Sustainability and Environmental Concerns
- Population and Consumption Trends
- Production Trends
- Relevance of Aquaculture
  - Value of Aquaculture to Global Supply
- Conclusion and Recommendation



# SUSTAINABILITY

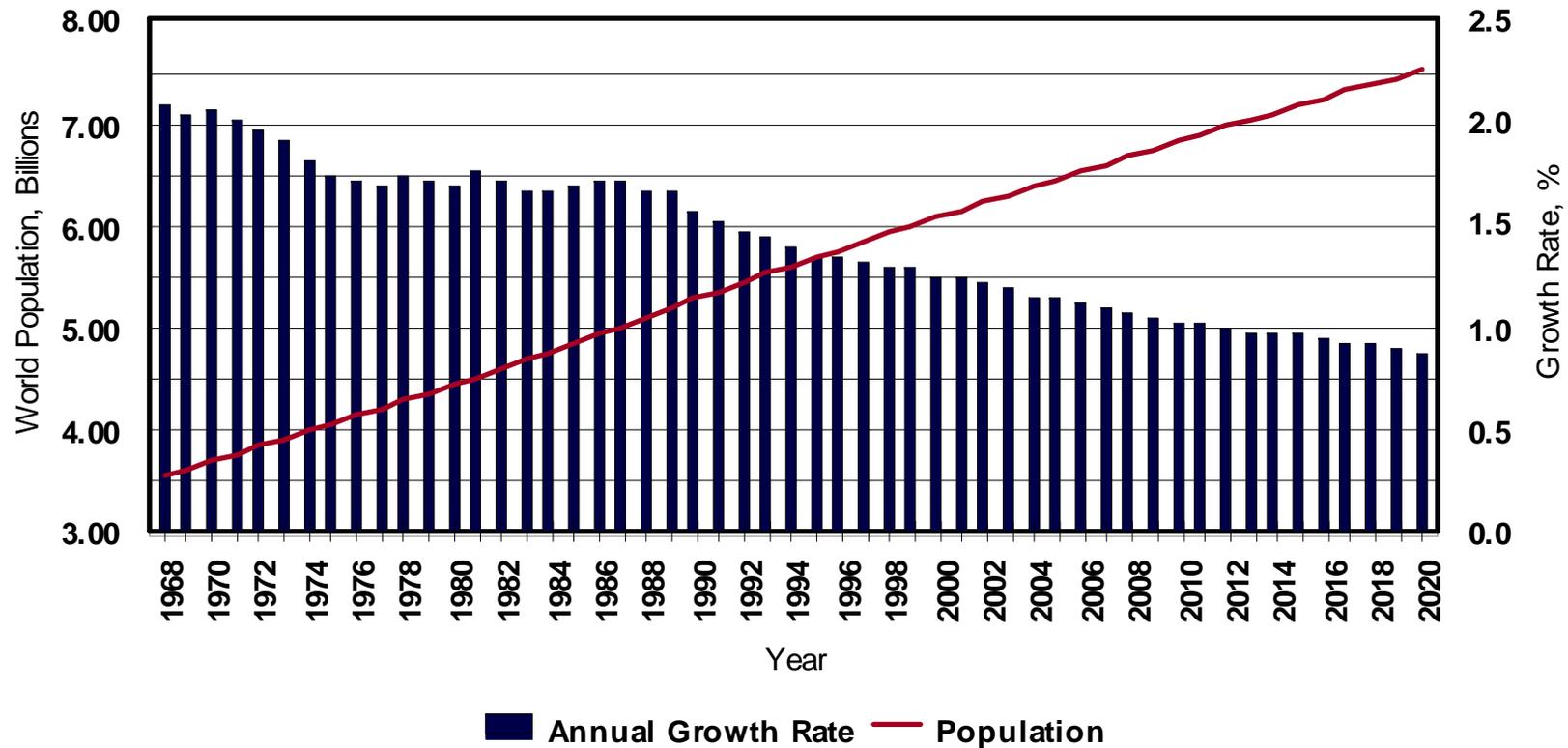
*“Using in a manner today that ensures a sound tomorrow . . . . using today in a manner that ensures our children will have enough . . . . no short term thinking.”*



# Population and Consumption Trends

- World
- United States

# World Population Growth 1968 – 2020E

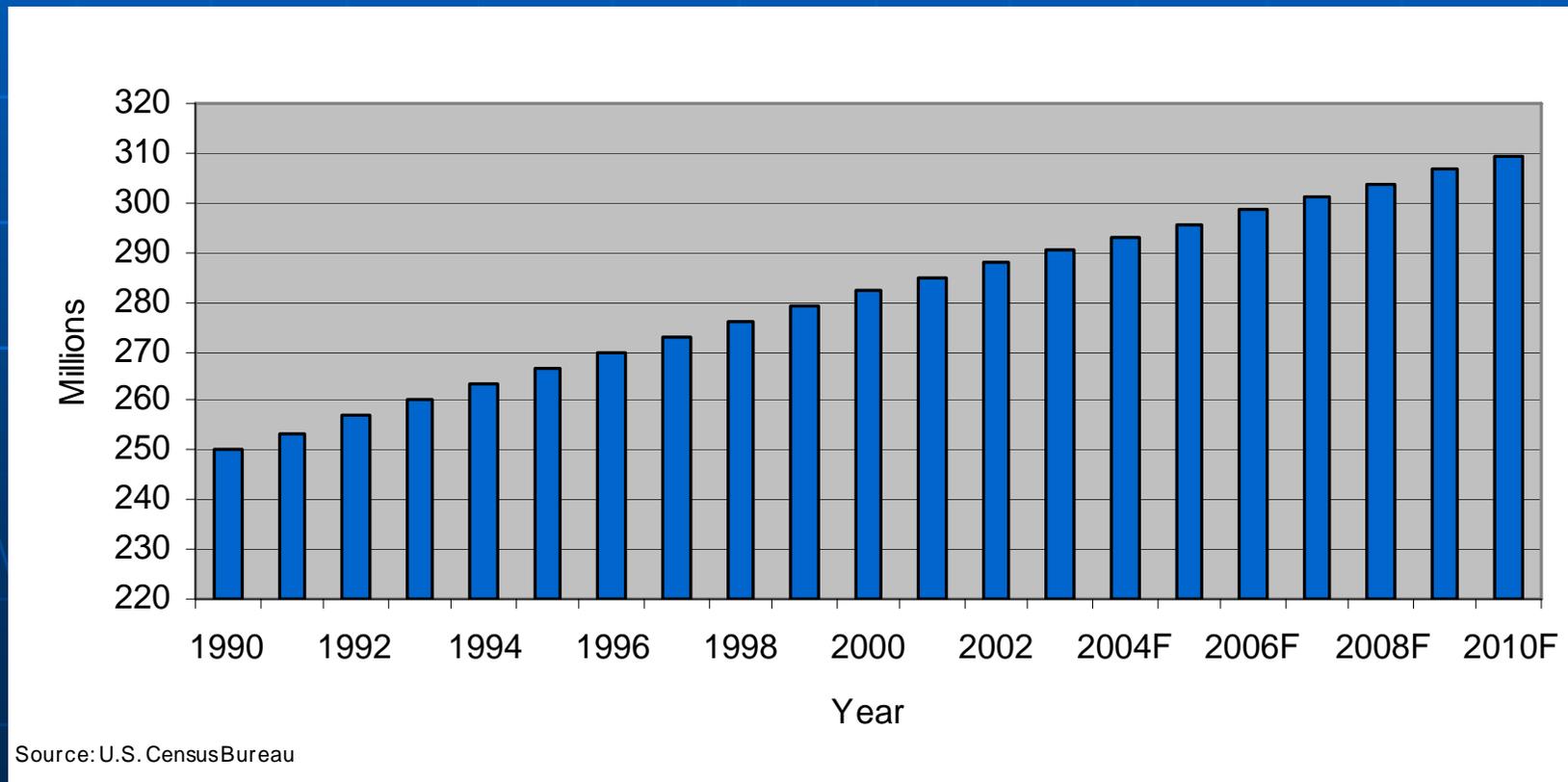


Source: U.S. Census Bureau  
2000-2020 are Projections

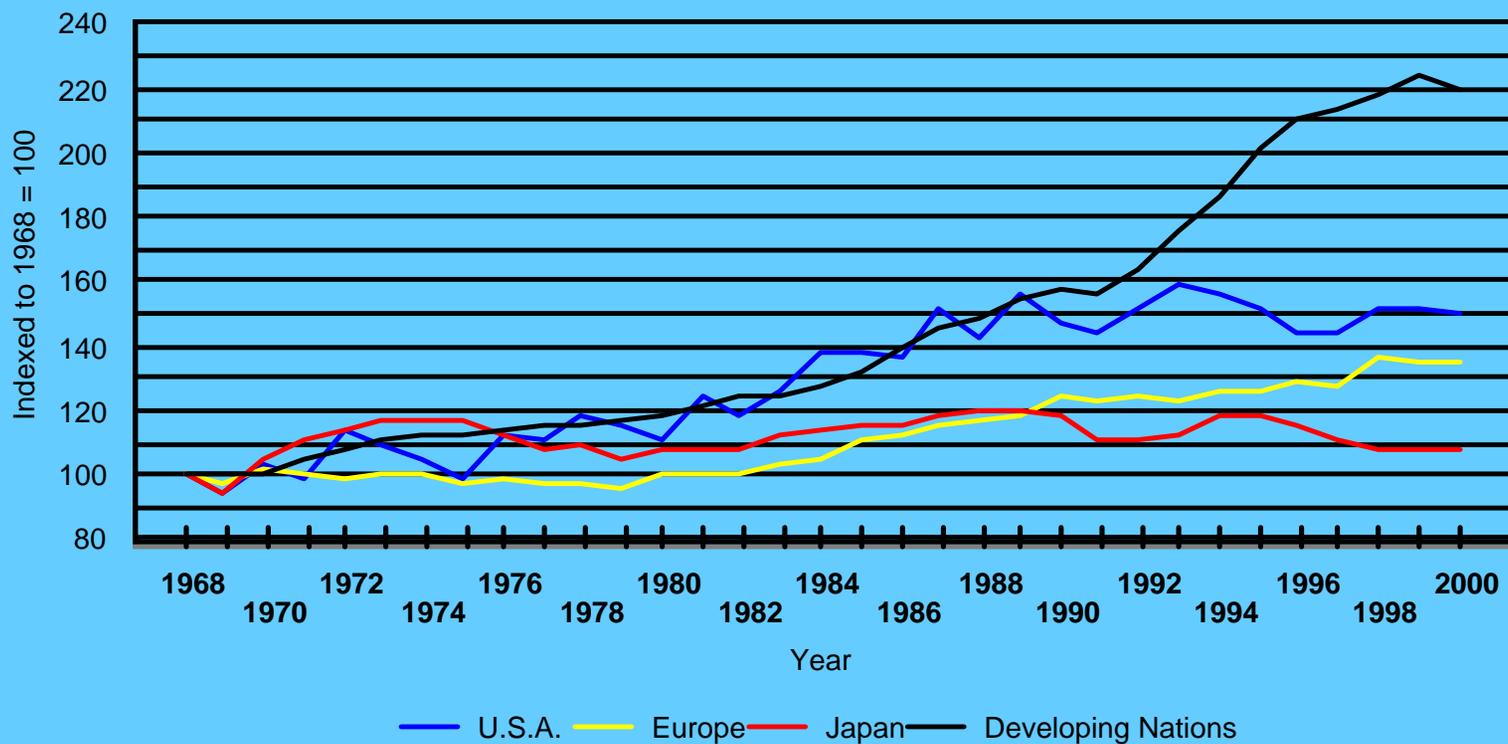
# U.S. POPULATION

## Historical & Projections

(Estimate 0.9% average annual change from base of 1999  
@ 272,690,813)

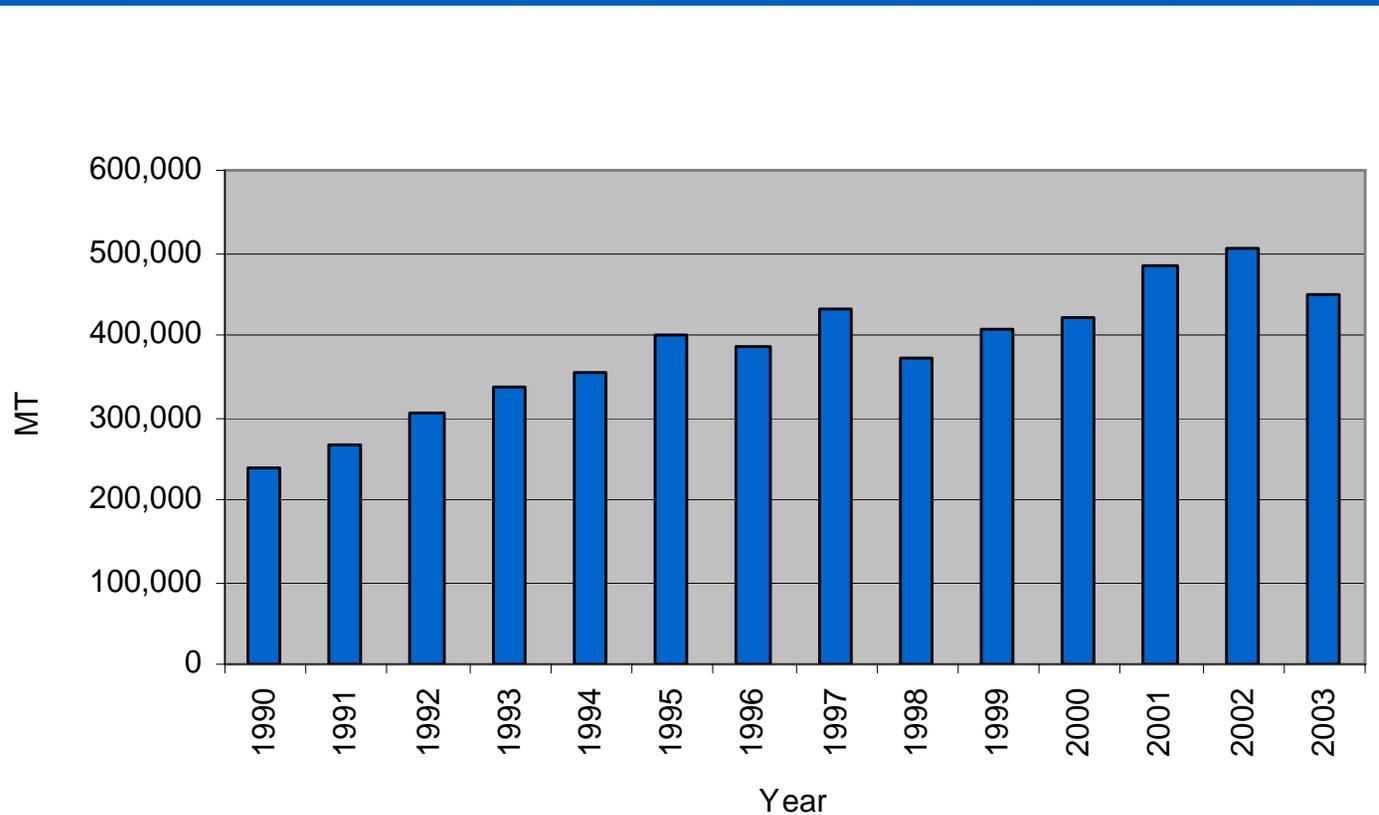


# Relative Consumption of Seafood in the World: 1968 – 2000, Per Capita



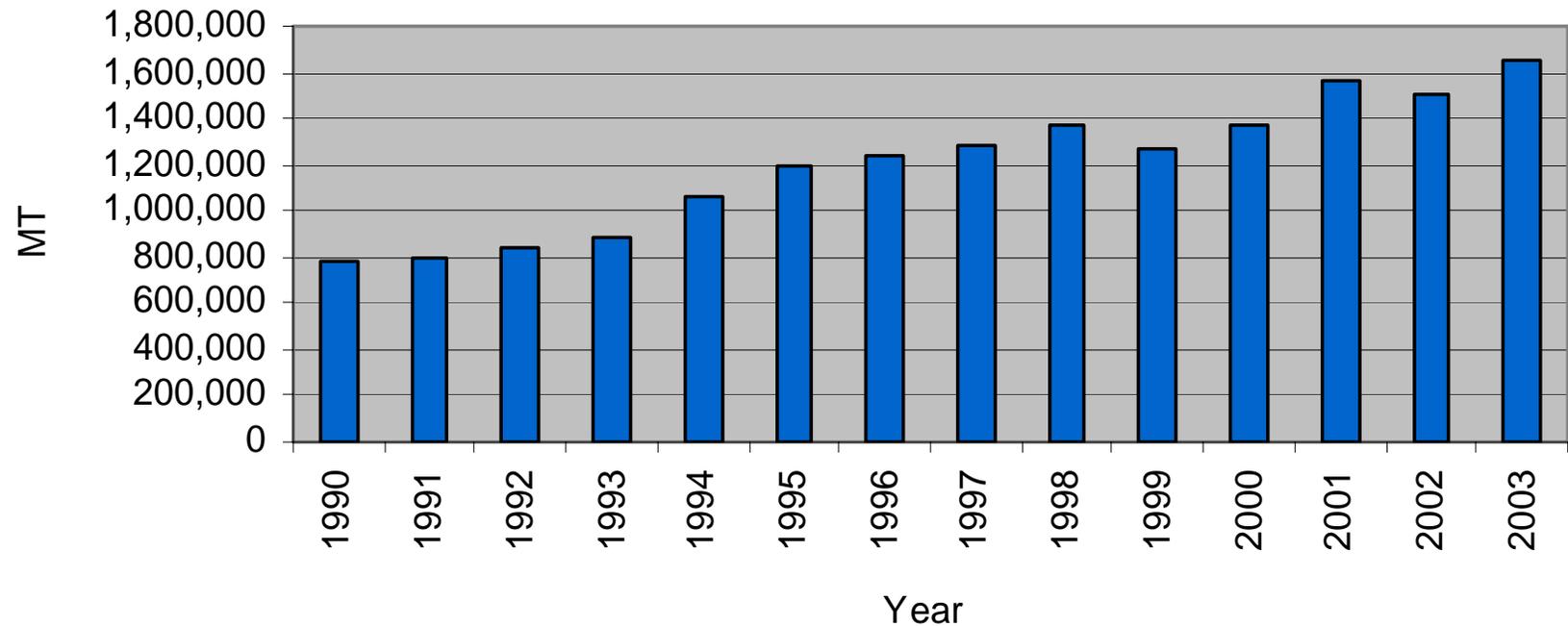
Source: FAO

# Japanese Fish Imports 1990 - 2003



Source: Urner Barry

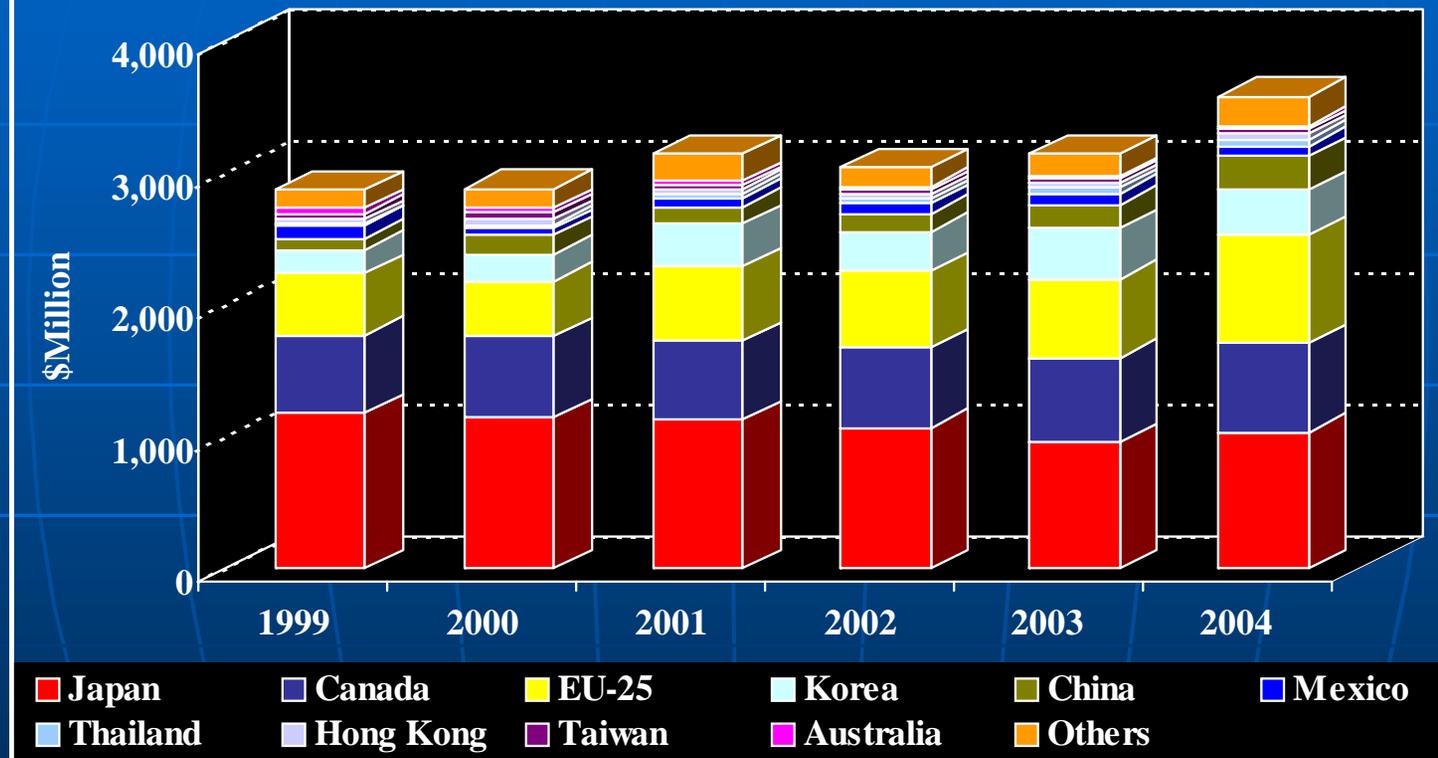
# European Fish Imports 1990 - 2003



Source: Urner Barry

# Recent Export Trends

## U.S. SEAFOOD EXPORTS TO THE TOP MARKETS



Source: DOC, U.S. Bureau of the Census

# U.S. Protein Consumption Indexed to Age

<b>AGE*</b>	<b>Seafood</b>	<b>Beef</b>	<b>Poultry</b>
<b>35-49</b>	<b>122</b>	<b>118</b>	<b>108</b>
<b>50-64</b>	<b>172</b>	<b>102</b>	<b>106</b>
<b>65+</b>	<b>159</b>	<b>80</b>	<b>83</b>

Source: US Bureau of Census, CREST

# Population Trends Are Favorable for Seafood in the USA

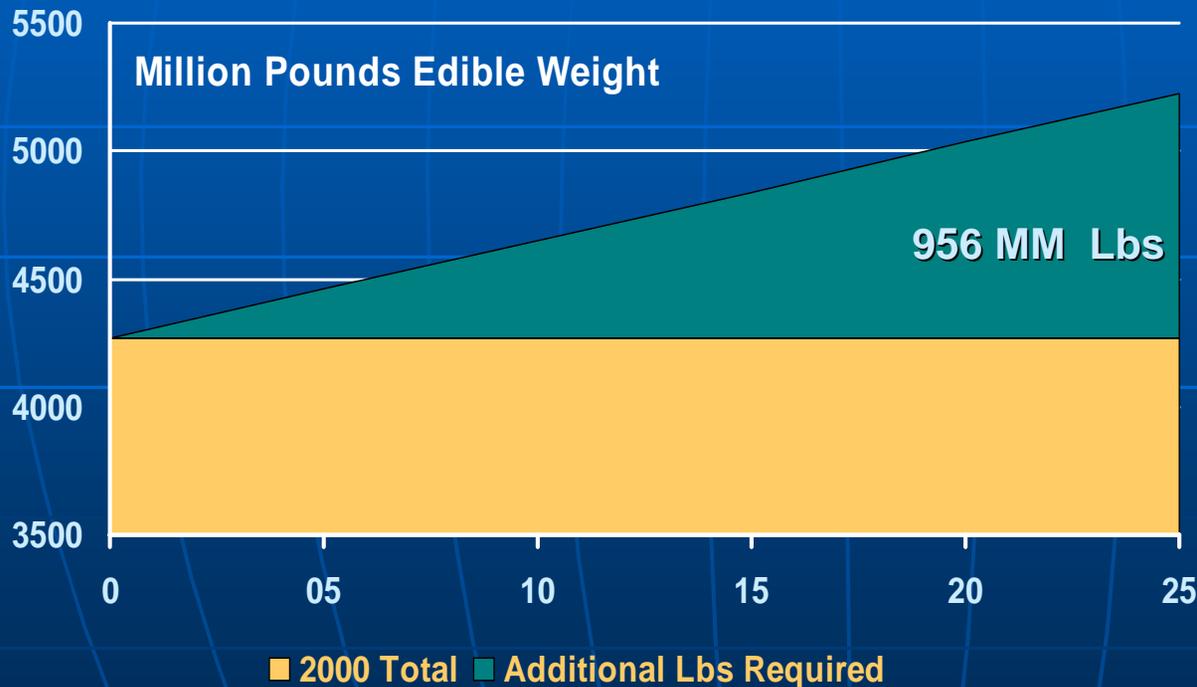
AGE*	2000	2008	% Change
40-49	40,674	42,929	6%
50-59	28,108	39,124	39%
60-69	19,833	26,050	31%

\* Age Trends (in millions)

\*\* Source: US Bureau of Census, CREST

# FUTURE U.S. SEAFOOD SUPPLY

To maintain per capita status quo (15.6 lbs.) will require approximately one billion additional pounds (edible wt.) by 2025



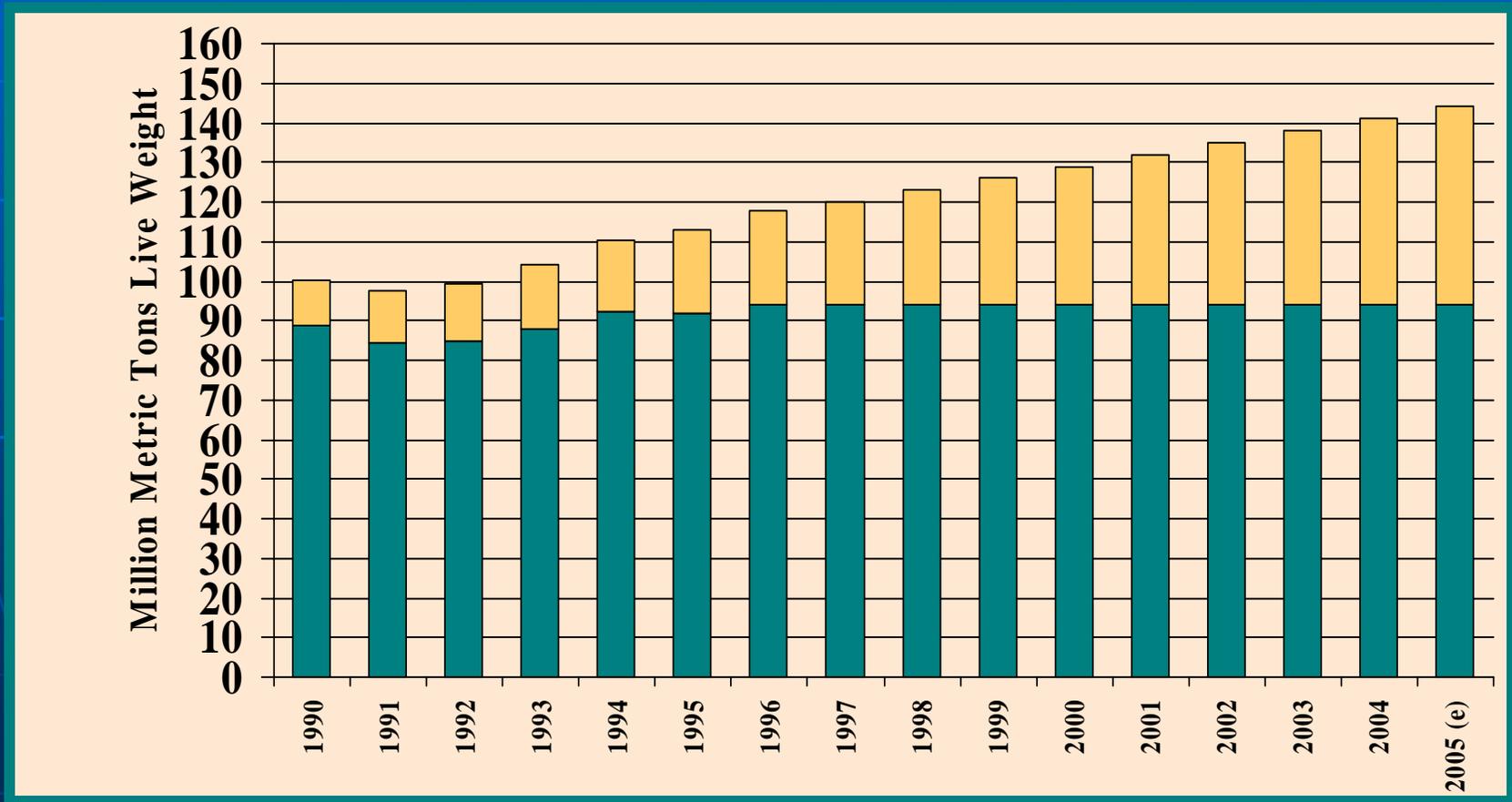
## Seafood Deficit

- 4 years – 250 MM lbs.
- 10 years – 500 MM lbs.
- 20 years – 956 MM lbs.

Source: University of Southern Illinois

# GLOBAL FISH SUPPLY History & Forecast

(Including Reduction Fisheries)



■ Aquaculture

■ Wild Harvest

**DARDEN**  
RESTAURANTS

# The Four Sources of Seafood Supply and Outlook to the U.S.

- **Domestic Wild**  
Stable to gradually decreasing over time
- **Domestic Aquaculture**  
Modest increase in production, but niche seafood only
- **Imported Wild**  
Stable to gradually decreasing over time
- **Imported Aquaculture**  
Will produce to fill any supply vacuum



# RELEVANCE OF AQUACULTURE

- ATLANTIC SALMON
- TILAPIA

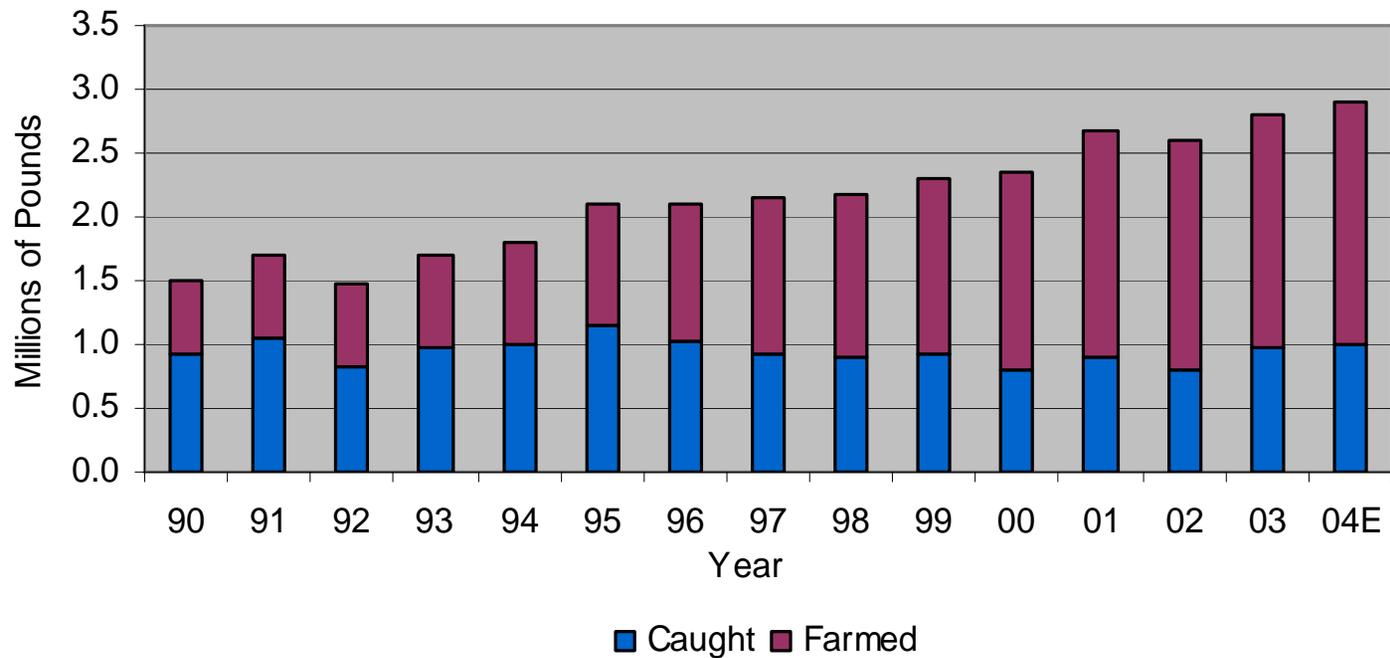


# AQUACULTURE BENEFITS

- Incremental Supply
- Consistency in Supply
- Uniform Quality and Food Safety
- Ability to Contract Prices
- Price Stability
- Increases Consumption

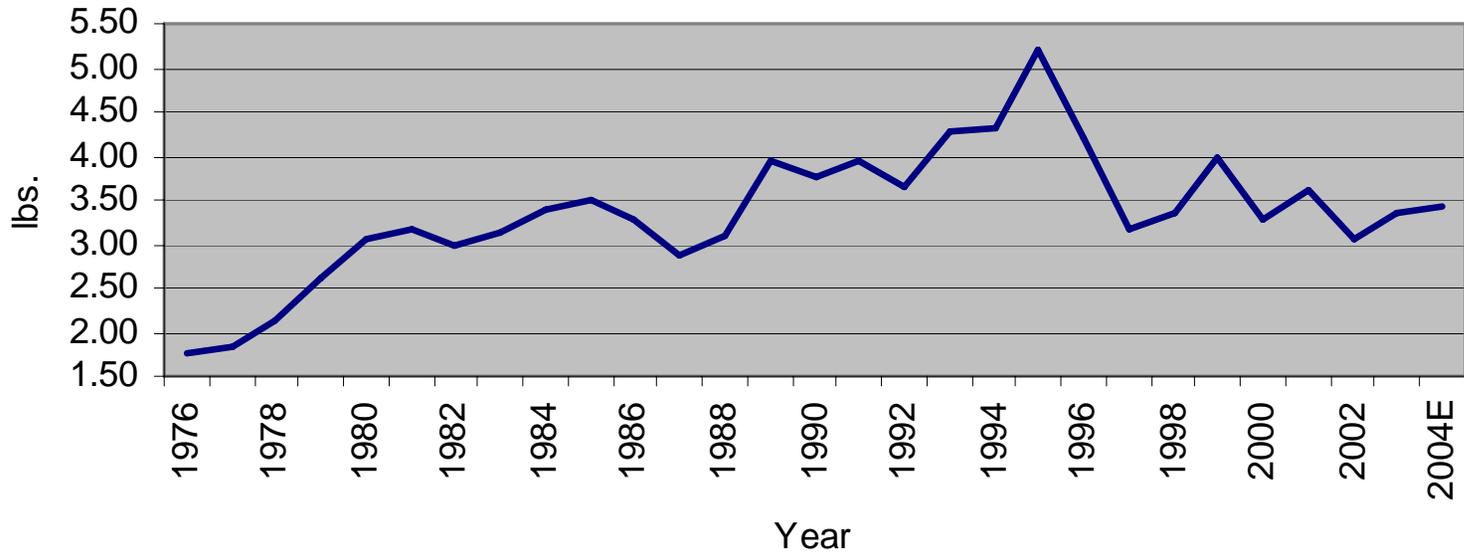
# Salmon Production

World Salmon Production, 1990-2004E



# Salmon Consumption

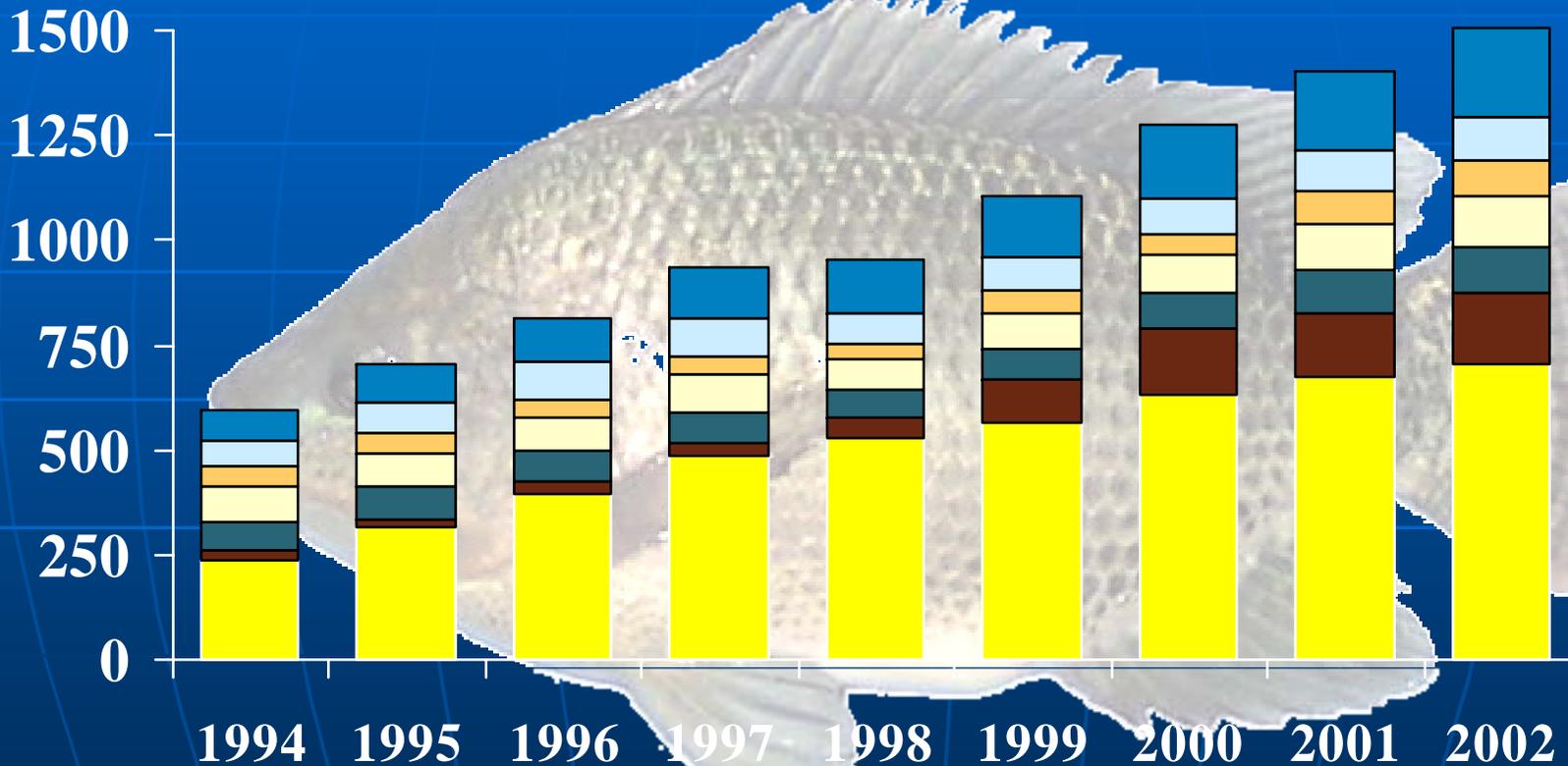
U.S. Per Capita Salmon Consumption, 1976-2004E



Consumption has more than doubled

# World Wide Tilapia Production

'000 MT



China

Egypt

Indonesia

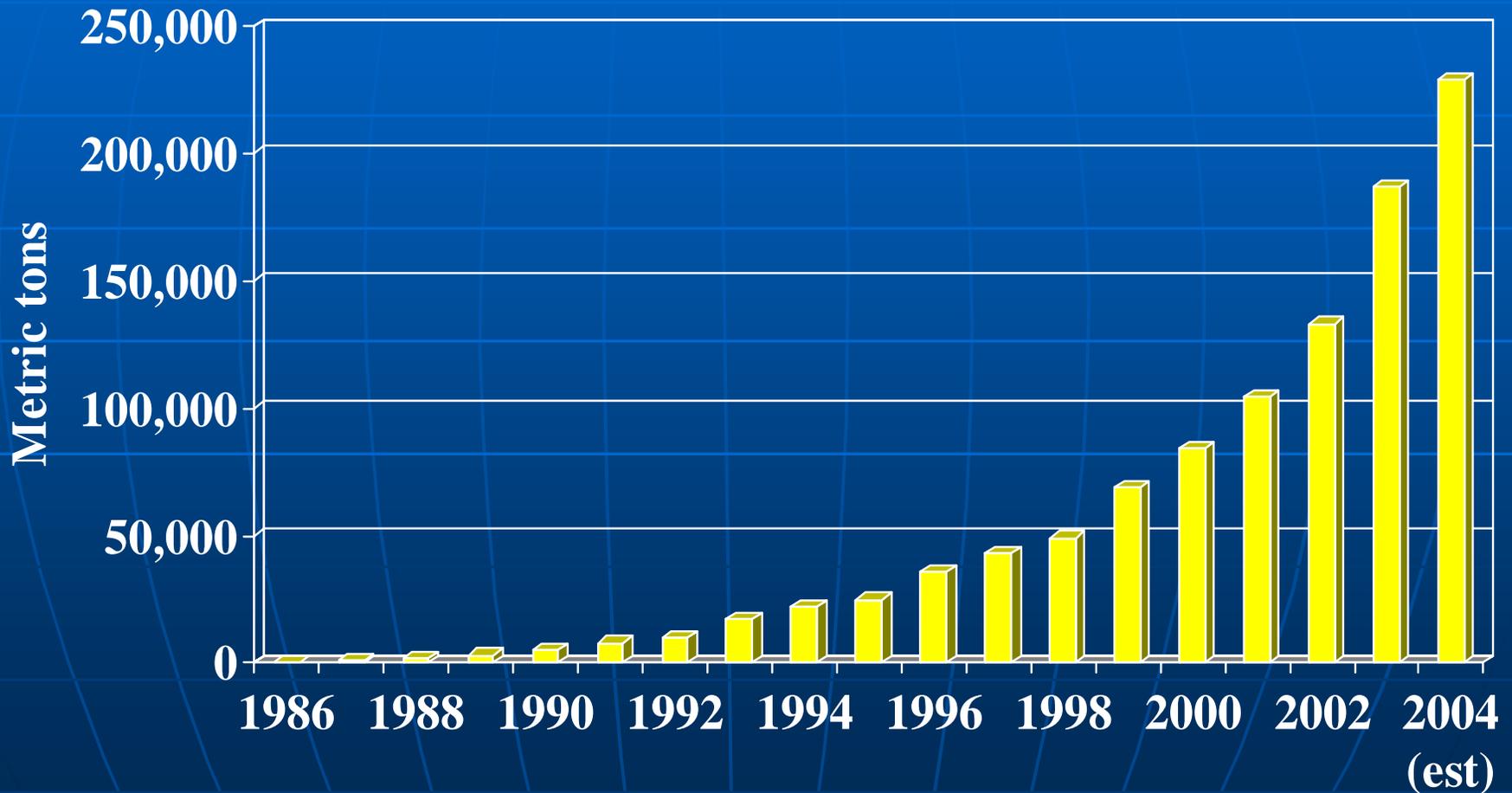
Philippines

Taiwan

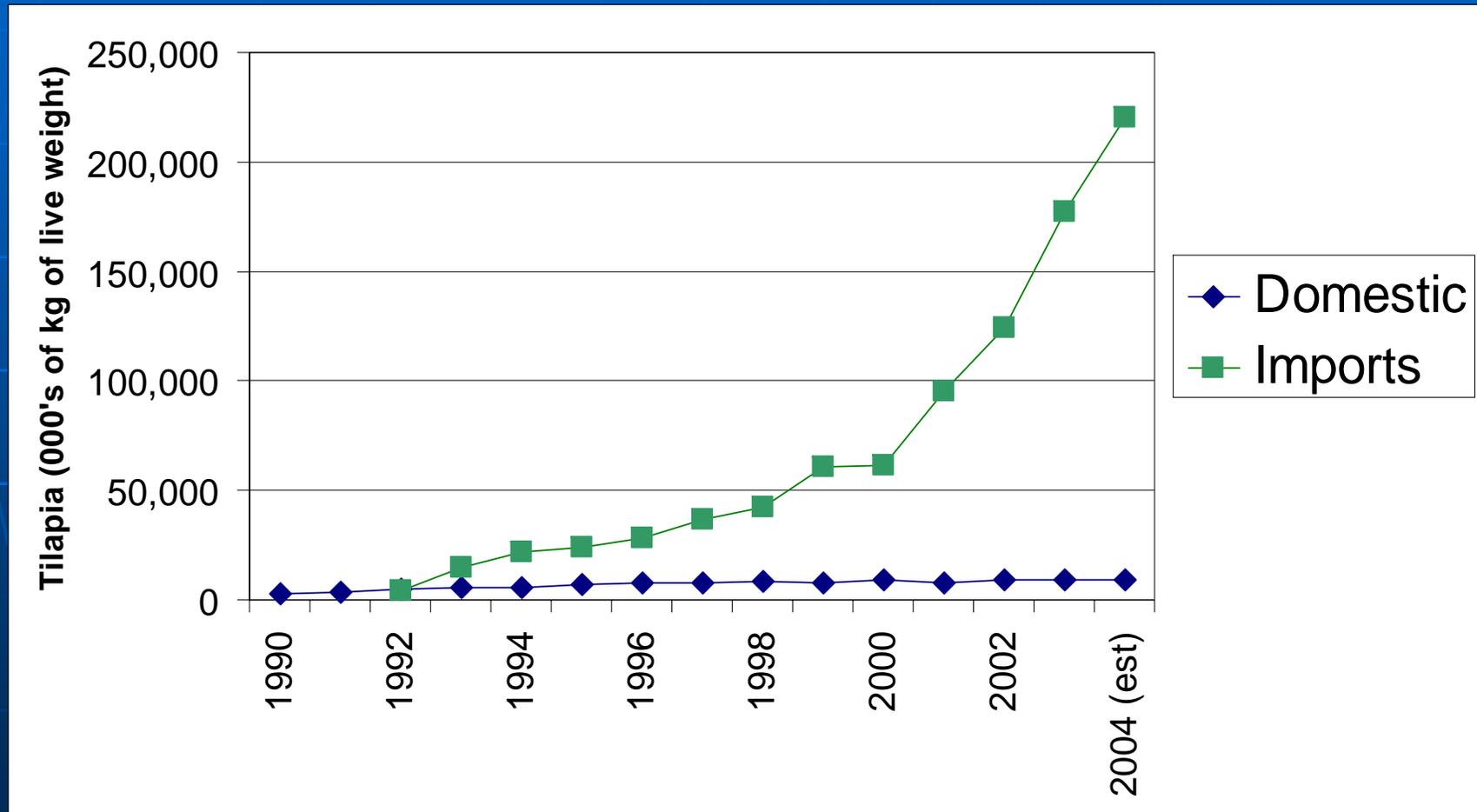
Thailand

Other

# U.S. Tilapia Consumption



# U.S. Consumption of Tilapia



# Conclusions

## Wild-Harvest Fisheries

- No growth forecasted in World catch at least through 2025

## World Population and Protein Demand

- Population continues to grow
- Demand growth in developing nations further stresses all protein resources
- Demand for seafood protein outpaces traditional seafood supply (current wild-harvest and aquaculture complex)

## Relevance of Aquaculture

- Aquaculture will grow to meet the gap in demand for seafood

# Darden's Position on Aquaculture

- Aquaculture is a critical part of the solution for feeding the world now and for generations
- Aquaculture and Wild-Harvest fisheries can co-exist and must co-exist
- Aquaculture can be utilized to rebuild dwindling or depleted fish stocks
- Sound objective science-based environmental studies should be performed to support new aquaculture endeavors
  - Explore off-shore, in-shore, and land-based aquaculture
  - Development of best practices to ensure sustainability
    - Examples are FAO and GAA best practices development for shrimp

# Seattle Times Editorial

“The problems associated with fish farming should not dissuade our delegation from supporting the Bush administration’s aquaculture bill...The oceans are near their lower limit in the output of wild fish...More and more, humanity will turn to farmed fish, which already represent 30 percent of the world market”.

**Source:** Seattle Times Editorial, *Fin Farms: inevitable*, June 10, 2005.

**Thank You**