

# Food Chains, Agrobiodiversity Conservation, and the Kitchen: a Political Ecological Approach

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# Overview

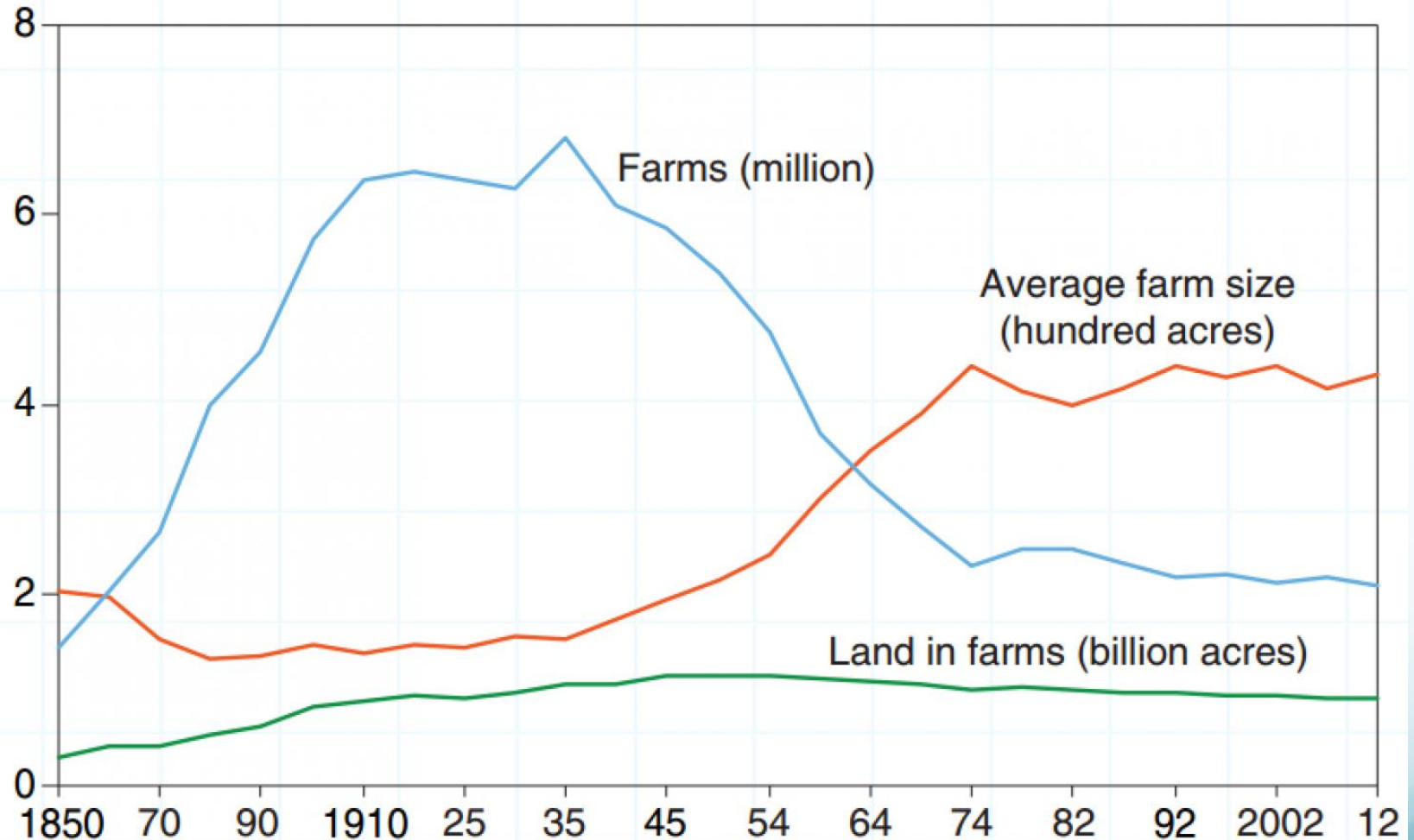
- The structure of the global modern food system and the domestic sphere
- Characteristics of 'traditional' rural subsistence (RS) food systems
- The RS food chain: Links between agrobiodiversity, food storage, processing, preparation, and culinary traditions in the domestic sphere
- Gender and post-harvest pressures leading to decreasing use and maintenance of agrobiodiversity

# The elephant in the biodiversity-food security nexus: the changing structures of 'modern' globalizing food systems

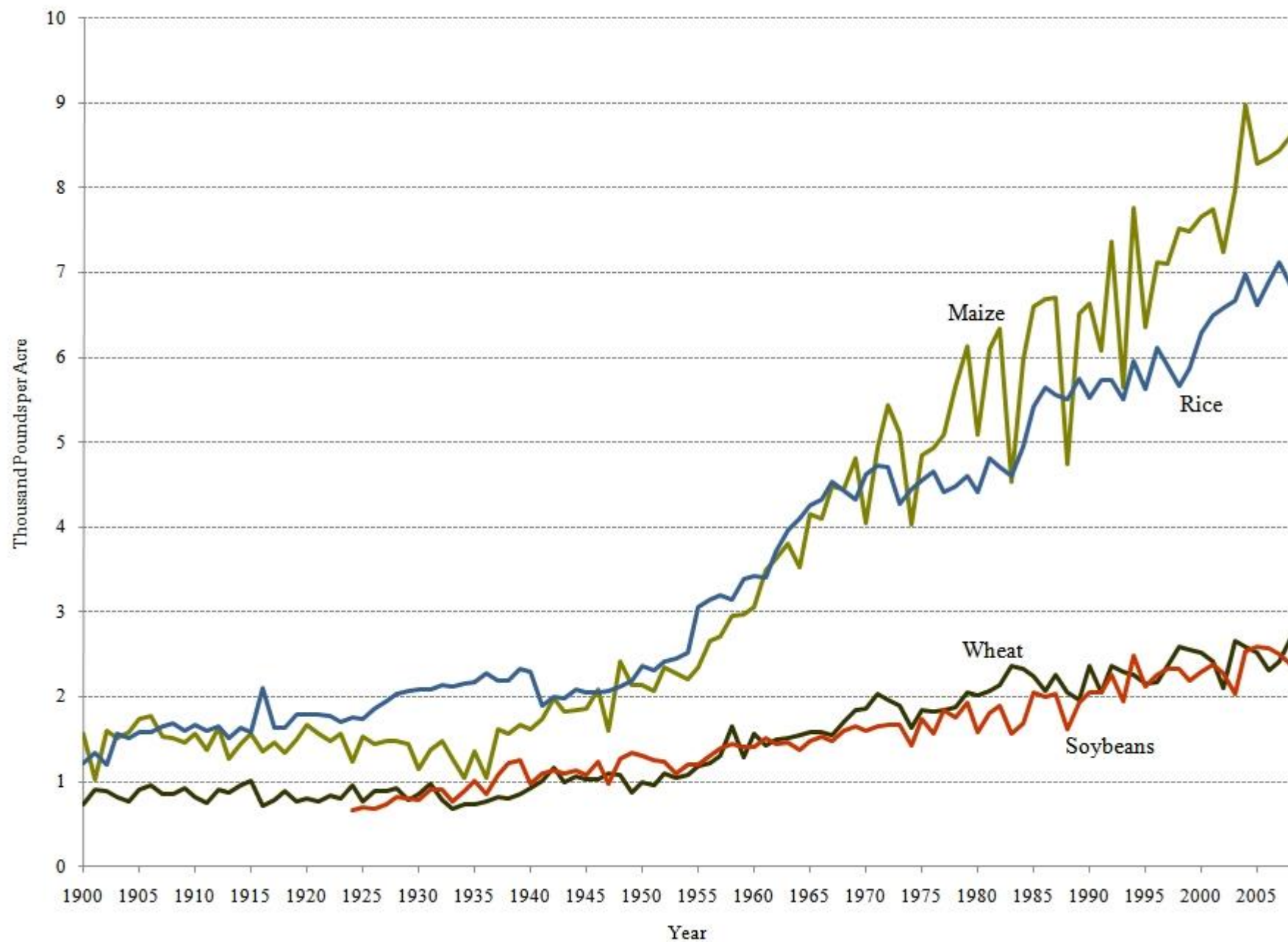


## Farms, land in farms, and average acres per farm, 1850–2012

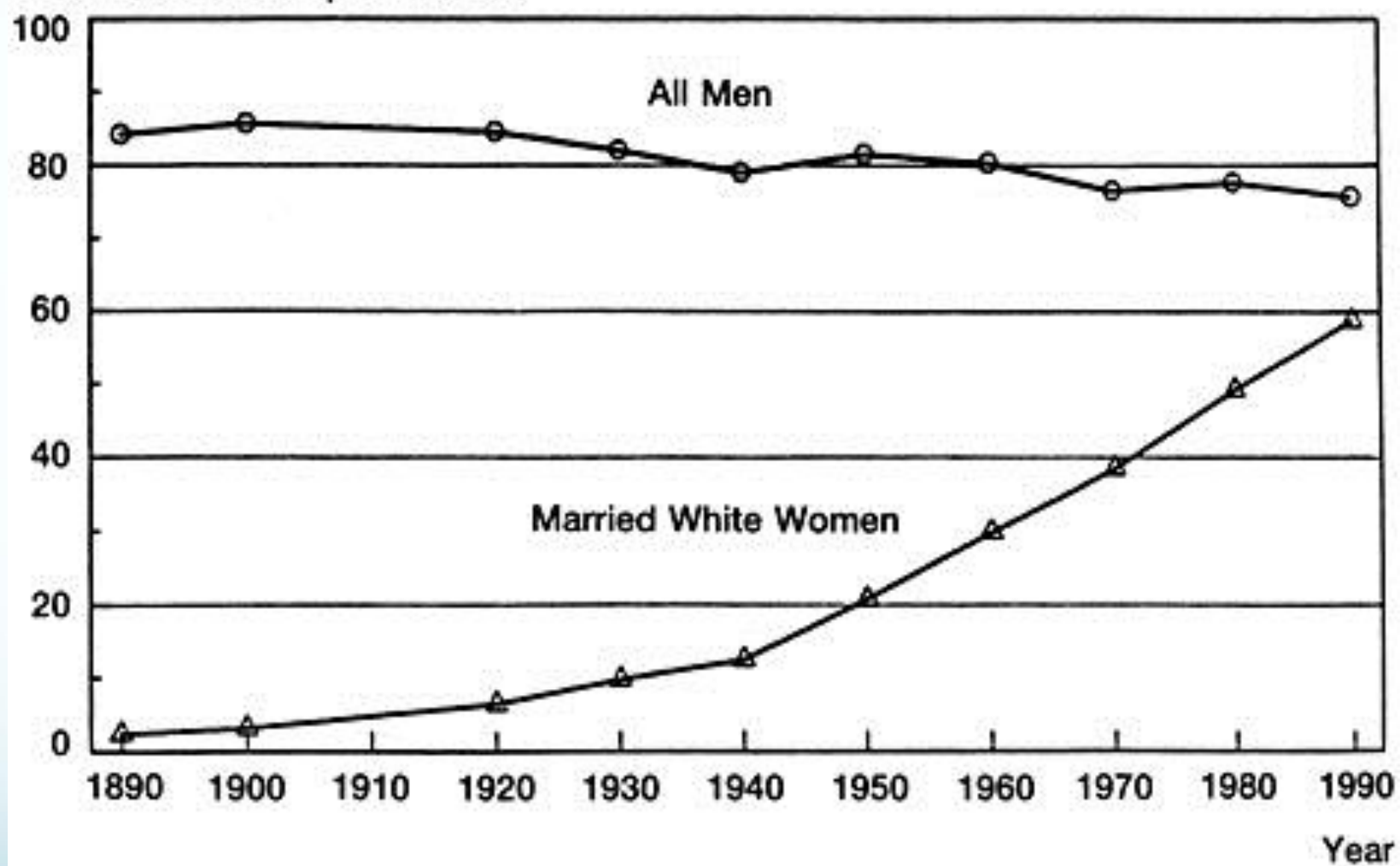
Million farms/hundred acres/billion acres



Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

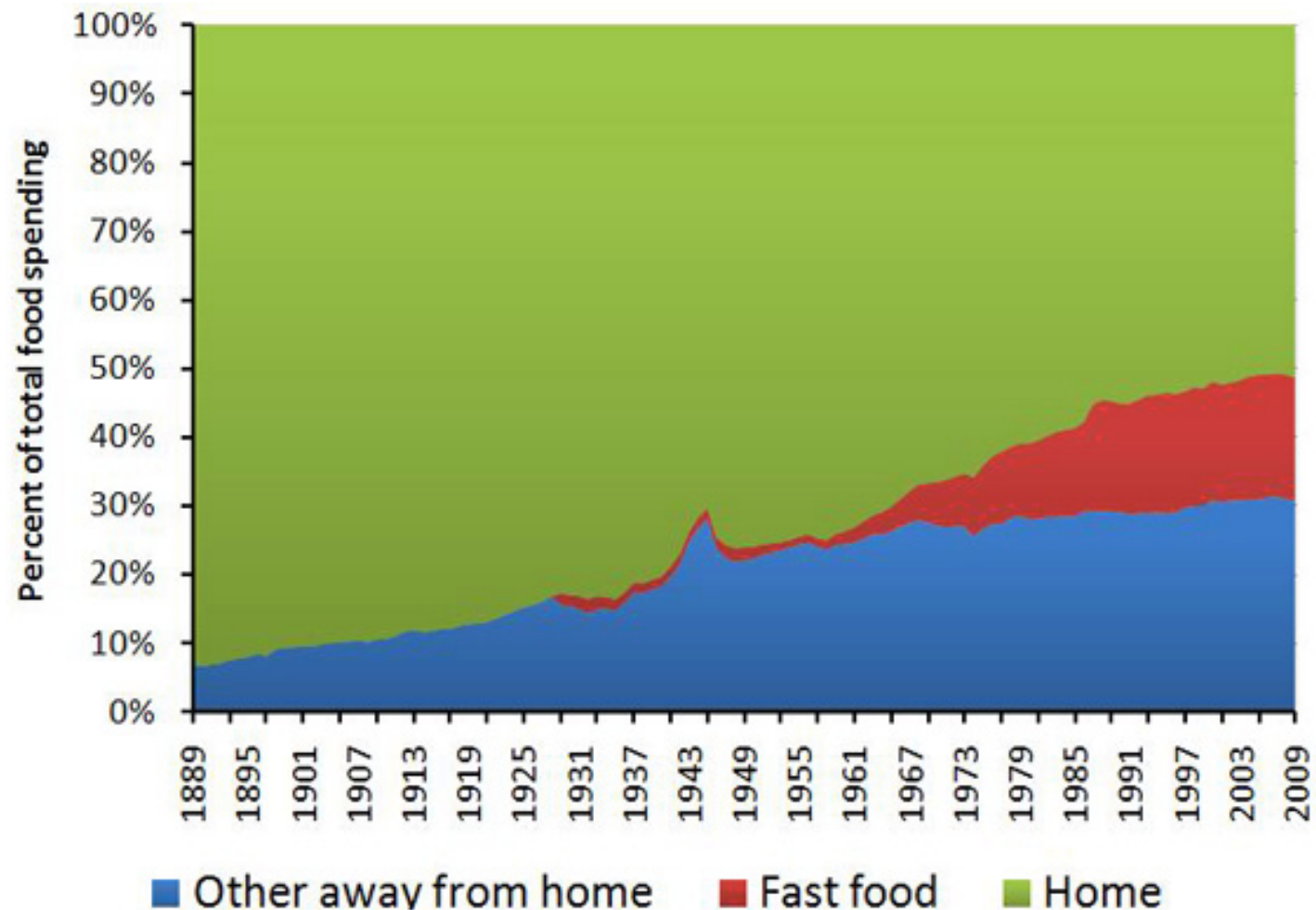


Labor Force Participation Rate



## 9. People Are Eating More Processed Foods Than Ever Before

### Where Americans Eat, 1889-2009



**Source:** Dr. Stephan Guyenet. [Fast Food, Weight Gain and Insulin Resistance](#). Whole Health Source.

## Market concentration is rising in global agricultural input industries

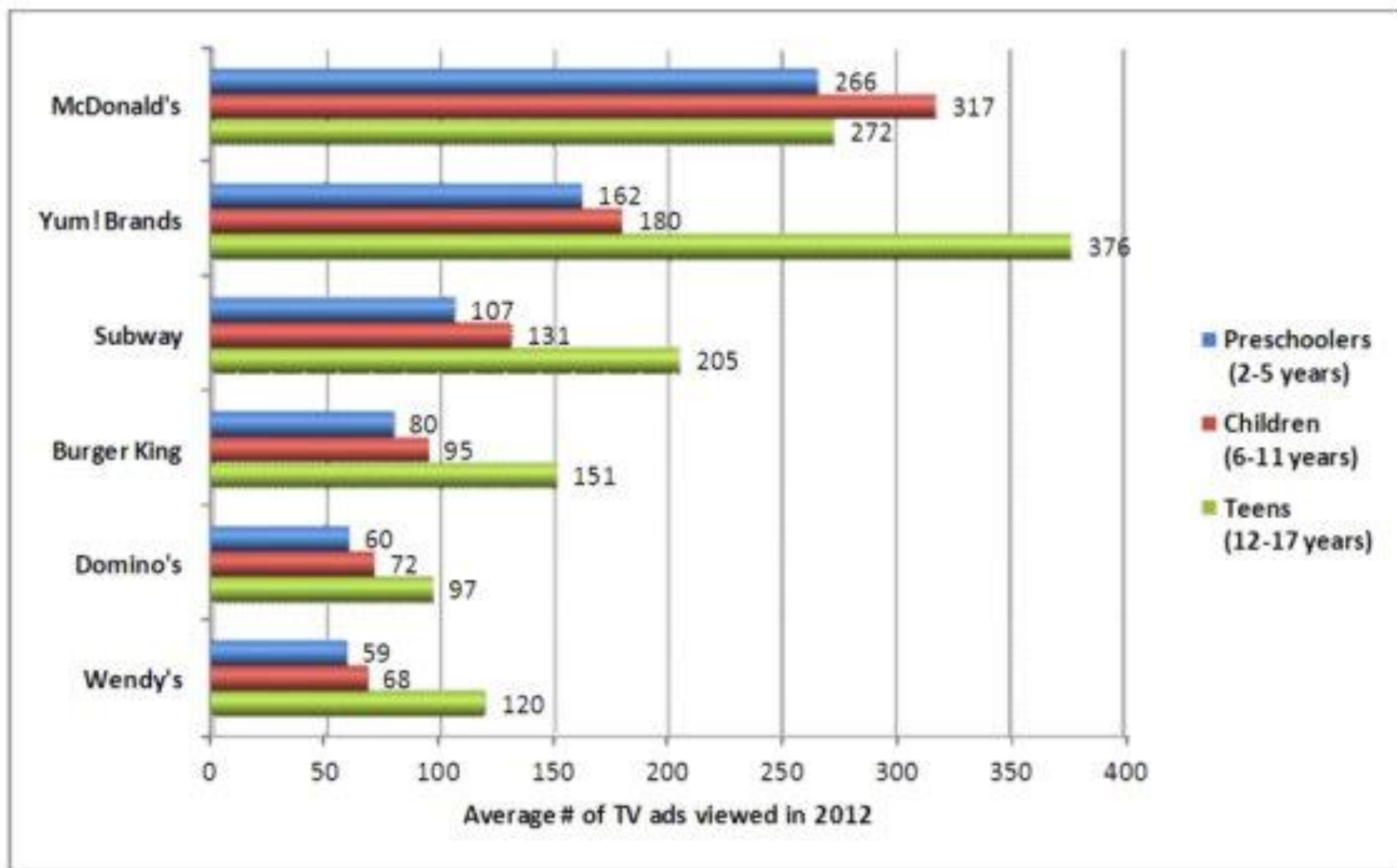
	Year	Four-firm concentration ratio	Eight-firm concentration ratio
<i>Share of global market (percent)</i>			
Crop seed and biotechnology	1994	21.1	29.0
	2000	32.5	43.1
	2009	53.9	63.4
Agricultural chemicals	1994	28.5	50.1
	2000	41.0	62.6
	2009	53.0	74.8
Farm machinery	1994	28.1	40.9
	2000	32.8	44.7
	2009	50.1	61.4
Animal health	1994	32.4	57.4
	2000	41.8	67.4
	2009	50.6	72.0
Animal genetics	1994	na	na
	2000	na	na
	2006/07	55.9	72.8

na = data not available.

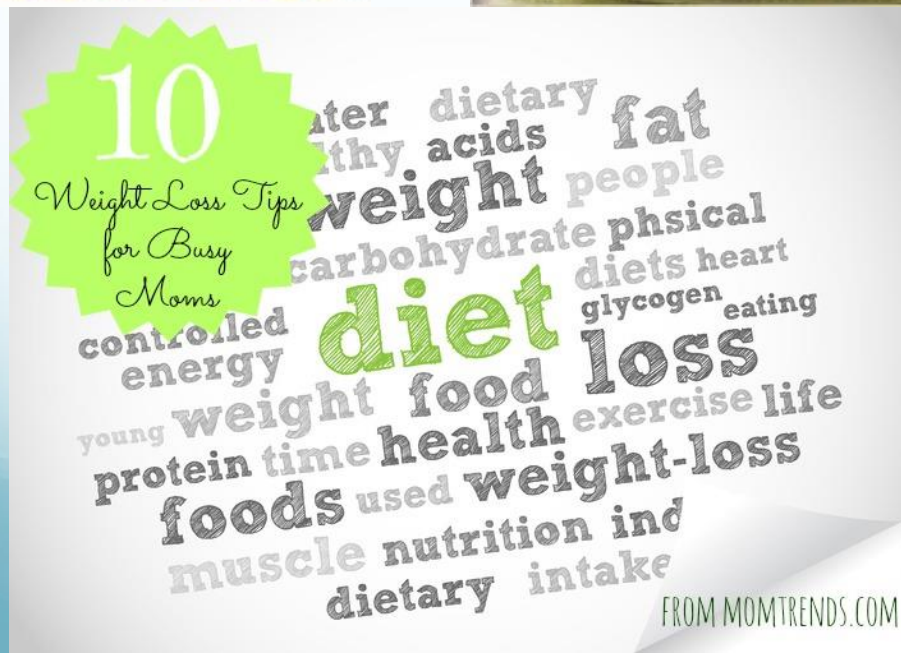
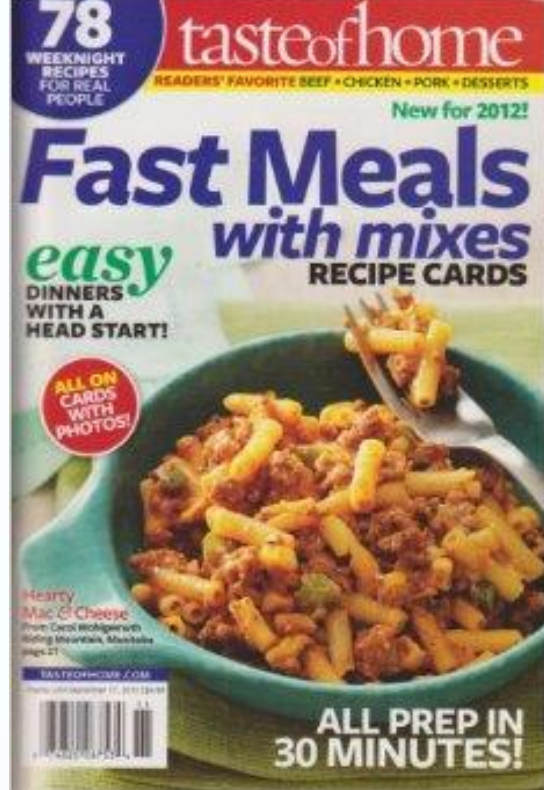
The concentration ratio measures the share of global market sales earned by the largest four or eight companies in the sector.

Source: USDA, Economic Research Service estimates from Fuglie et al. (2011).

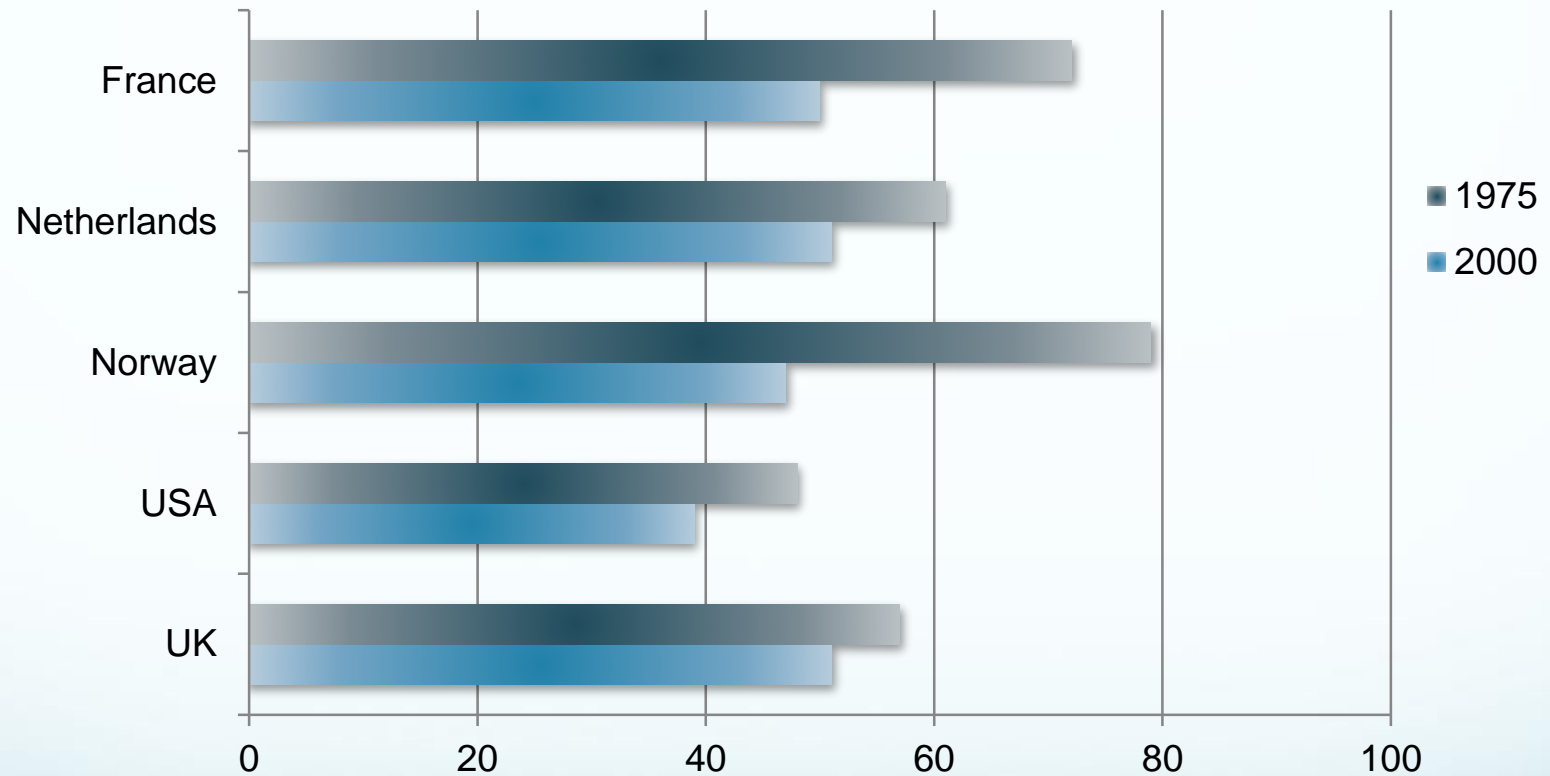




Source: Nielsen (2012)



## USA and Europe: Time spent in food preparation per day 1975-2000




Warde et al. **Changes in the Practice of Eating**  
**A Comparative Analysis of Time-Use.** *Acta Sociologica* 2007 50(4).

"We'll have lots to eat this winter, won't we Mother?"



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HOW TO  
**GROW AND PRESERVE**  
YOUR OWN FOOD

**TOP TIPS FOR GREAT FALL GARDENS**

**PLUS:**

- Easy Crops to Can or Freeze, P. 16
- Extend Your Growing Season
- Instant No-Dig Garden Beds
- Simple Ways to Store Crops, P. 54
- DIY: Hoop House & Food Dehydrator
- Best Vegetable Seed Companies

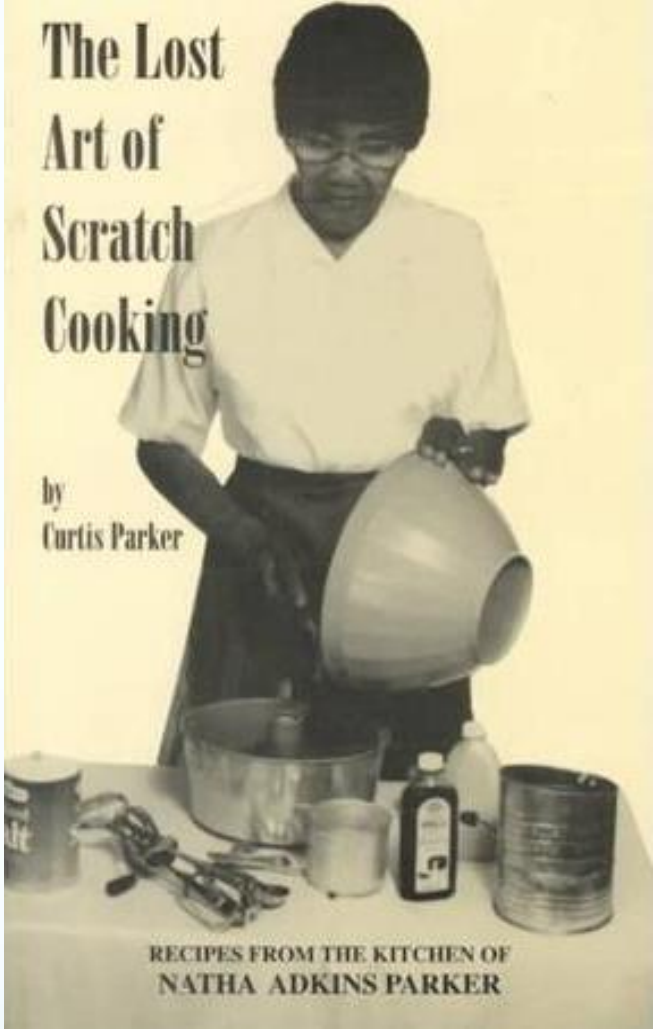


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NATHA ADKINS PARKER

# Transformation of Markets for Agricultural Output in Developing Countries Since 1950

T. Reardon & C.P. Timmer 2005.

- **“Agricultural output markets in developing countries have changed fundamentally and rapidly since 1950...[reflecting] a shift from a traditional to a modern phase....At the end of the period we see consolidation downstream in the agrifood system (in the processing and retail segments), including the rapid rise of large-scale processors, supermarkets, and food service chains.”**
- **“*Naturally*, this transformation from the traditional to the modern phase does not occur at a uniform rate across regions, or countries, or zones, or between rural and urban areas. The transformation can be observed as a diffusion process, of new organizations, institutions, and technologies in the food system – which occurs first and fastest in urban areas of the richer developing countries. These then ripple out into their own rural towns and into other developing countries.” [own emphases]**



Where there is no  
doctor supermarket...



# Rural Subsistence Food Systems

- Large number of wild and domestic species
- Local culinary traditions
- Storage is local small-scale, often domestic
- Transport is local, often non-motorized
- Processing is small-scale, mainly domestic
- Distribution is local, often non-monetary (e.g. gift-giving)
- Not oriented mainly toward income generation, but to social and subsistence goals



# Culture and nature co-evolve







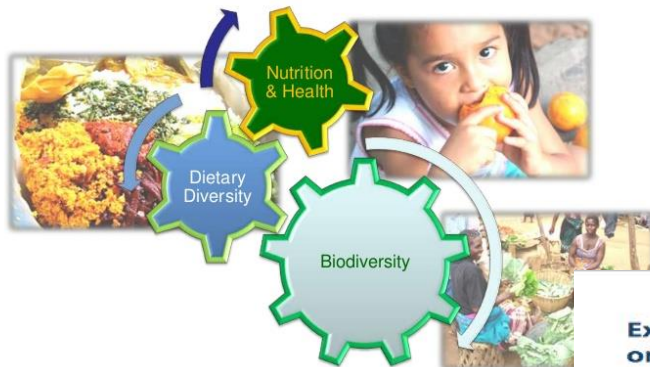
Culinary traditions are founded upon locally available species



# Agrobiodiversity and nutrition



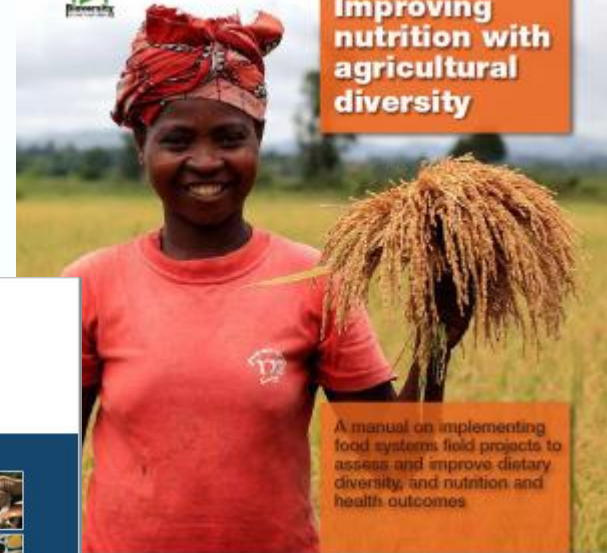
## Importance of agrobiodiversity



## Expert Consultation on Nutrition Indicators for Biodiversity 2. Food consumption



## Improving nutrition with agricultural diversity



# Food based on much more than agriculture



# Agrobiodiversity maintenance comes from use (e.g. Zimmerer 2003)

- Much more than environment
- More than agronomy
- 70% of thousands of potato and maize varieties are used for post-harvest characteristics (e.g. freeze drying, boiling, soup, beer making)
- Women select, store, process, and prepare, and know many more taxa



# 400+ Malawi bean varieties

(Ferguson, 1990; Sperling & Berkowitz 1994)

- 75% of selection criteria related to post-harvest, 50% to taste, cooking quality, and health, e.g.
  - Pods and leaves for 'hunger' periods
  - Cooking time
  - Storability



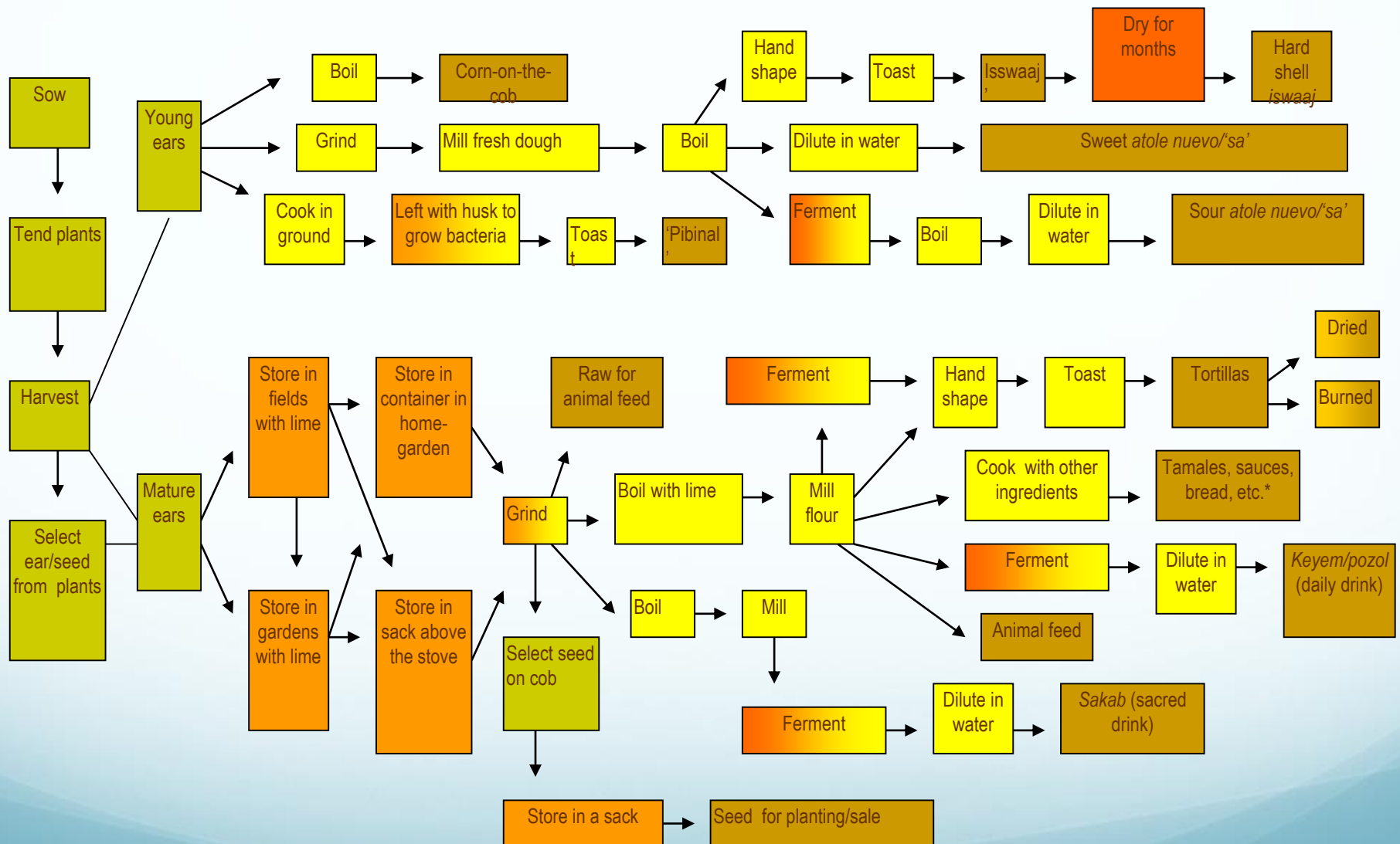
# Selection criteria for one maize variety, Yucatan

(Lope-Alzina, D. *Singapore Journal of Tropical Geography*, 2008)

Selection Criteria	Sex
Strong plants	M
Drought resistance	M
High yielding	M
Can be stored in the field	M
Inherited seed	M
Easy and fast to degrain	F
Easy to grind	F
Fast cooking time	F
Easy to shape into tortillas	F
Consistent dough	F
Does not become 'soupy'	F

# Processing chain for one maize variety

(Lope-Alzina, Ibid. 2008)



# Storage, processing and preserving

- Make plant materials edible
- Improve nutrient values, digestibility
- Eliminate toxins, pathogens and improves quality
- Prolong availability
- Meet local culinary requirements
- Technology and labour available condition use



# Storage





Freezing



Canning

Smoking





# Fermenting



# Women's Reasons for Fermenting Complementary Foods, Nigeria

(Nnanyelugo et al. 2003)

Reasons	Awka	Onitsha	Enugu	Nsukka
Improves taste	11.20	1.12	22.49	11.04
Mother's advice	0.00	1.12	0.96	0.00
Health visitor's advice	0.80	0.00	0.48	0.00
Helps child grow	1.60	50.28	0.48	26.21
Food is soft	19.20	0.00	0.00	0.69
Improves digestibility	2.40	0.06	1.91	1.38
Child eats more	1.08	10.05	3.35	7.59
Enhances flavor	8.80	0.56	11.97	6.90
Enhances color	0.00	0.00	5.26	5.54
Removes toxins	17.60	3.91	27.27	6.21
Improves nutrient content	2.40	15.65	0.48	14.49



# Preparation



e 2 The stove (*uton*) common to Tigray Region

# Ethnoecological knowledge and skills in storage, processing, preserving, and preparation

- Properties of species and species' parts
- Pests and pathogens and their management
- Materials, and material and chemical processes
- Construction of structures and implements
- Nutritional requirements and food preferences of different groups
- Cultural norms and values about distribution, rituals, etc.

Takes at least a third of a lifetime to accrue

Must be transmitted systematically

# Swaziland's decline in agrobiodiversity and food security (Malaza 2003)

- Decline in consumption of traditional crops (cow peas, juko beans, sorghum, millet, sesame, pumpkins, wild leafy vegetables)
- Women lack time to collect wild foods; preparation is time-consuming
- Lack of improved technology for sorghum processing, processing is time-consuming
- Low status of traditional vegetables
- Urban female wage employment : lack of availability, processing constraints, lack of knowledge, loss of taste for traditional foods







**Avg. labour = 4 hours  
per family per day**





# Women and genetic erosion in the post-harvest sphere

- Increasing influence of the global agroindustrial food system:
  - Declining status of traditional foods, reliance on exotic species
  - Cheap foodstuffs compete with local species
  - Formal seed systems & government policy erode local seed access
- Need for cash, off-farm work and outmigration – loss of labour, knowledge
- Formal education, declining status of traditional knowledge
- Time constraints
- Decreasing status of women's knowledge, work, and everything domestic and traditional

# Some conclusions

- Food security and nutrition in most subsistence-oriented societies depend principally on local agrobiodiversity
- Most agrobiodiversity is maintained in such small subsistence societies
- Agrobiodiversity will be sustained *only* if demand continues
- Demand depends *even more* on the post-harvest chain than on agronomic and environmental conditions

- Women influence agrobiodiversity directly through production (farm, homegarden), and indirectly through post-harvest demand
- Pressures on women's time are leading to declines in agrobiodiversity
- Changing diets and the status of traditional foods are leading to declines in agrobiodiversity
- In conceptualising agrobiodiversity conservation, there is insufficient focus on the domestic sphere, food processing, preparation, women, and women's constraints

Should these women conserve for the rest?  
Or should driving forces be addressed?

