this is a major work on the social, political, and nutritional consequences of “The Agricultural Revolution” . . . and it’s a very good read
Nutritional Consequences of the Agricultural Revolution: A Comparison of Foragers and Agriculturalists (Indian Knoll and Hardin Village)
Food in Historical Perspective: Dietary Revolutions

• The Agricultural Revolution of the Neolithic Era
• The Search for Spices
• The Industrial Revolution
• Transportation, Refrigeration, and Canning
• The Scientific Revolution
• Modern-Day Adaptations
• Summary
• Highlight: Vegetarian Diets: Then and Now
Food in Historical Perspective: Dietary Revolutions

- The Agricultural Revolution of the Neolithic Era
  - Development of Agriculture in the Tehuacán Valley
  - Nutritional Consequences of the Agricultural Revolution: A Comparison of Foragers and Agriculturalists
    - Social and Political Consequences of the Agricultural Revolution
examples:

Tehuacán, Puebla, Mexico

pre-Columbian Kentucky

• the changes toward dependence on agriculture was not always swift
• in the short term, it was not always healthful
examples:

Tehuacán, Puebla, Mexico

pre-Columbian Kentucky

• the changes toward dependence on agriculture was not always swift

• in the short term, it was not always healthful

The Cultural Feast, 2nd Ed., p. 49
with

hunters and gatherers

times of food scarcity certainly exist but

famine is a relatively infrequent occurrence

• and chronic malnutrition is even rarer

The Cultural Feast, 2nd Ed., p. 54
with the advent of agriculture, the picture changes . . .

- dependence on a small number of cultivated crops or domesticated animals increases the risk of widespread famine
with the advent of agriculture, the picture changes . . .

• a less diversified diet makes it far harder to achieve an adequate balance of essential nutrients
  • especially protein and certain vitamins

(Cf., other slide sets for information on proteins and vitamins)
with the advent of agriculture, the picture changes . . .

• vitamin deficiency diseases are especially problematic in grain-dependent communities

*The Cultural Feast, 2nd Ed.*, p. 54
Claire Cassidy
(1980)

The Cultural Feast, 2nd Ed., p. 54
Comparing Health Paradigms

Interview with Claire Cassidy, PhD, LAc

By Daniel Redwood, DC

Claire M. Cassidy, PhD, LAc, is among the most original thinkers in the field of comparative medicine. She has written extensively in academic journals and textbooks about the methods known as complementary and alternative medicine (CAM) and their relationship to mainstream or biomedicine. She has a special ability to translate complex ideas into language that non-experts can readily understand. Trained as a medical anthropologist, she later became a licensed acupuncturist and now practices in Bethesda, Maryland.

Dr. Cassidy is an associate editor of *The Journal of Alternative and Complementary Medicine* and has over 65 professional publications to her credit including books, chapters, and articles. She is the author of the textbook, *Contemporary Acupuncture and*
Claire Cassidy (Ed.) (1980)

Nutrition and Health in Agriculturalists and Hunters and Gatherers

NY: Redgrave

The Cultural Feast, 2nd Ed., p. 54
Claire Cassidy
(1980)

• assessed the nutritional impact of the introduction of agriculture on pre-Columbian Native Americans

• examined skeletal remains of two precontact villages in Kentucky

*The Cultural Feast, 2nd Ed.*, p. 54
Indian Knoll

foragers

ca. 5,000 ybp

*The Cultural Feast, 2nd Ed.*, p. 54
Indian Knoll
foragers
c.a. 5,000 ybp

Hardin Village
agriculturalists
c.a. 1,000 ybp

The Cultural Feast, 2nd Ed., p. 54
Indian Knoll
foragers
c. 5,000 ybp

Hardin Village
agriculturalists
c. 1,000 ybp

had very different diets
Indian Knoll: foragers (ca. 5,000 ybp) and Hardin Village: agriculturalists (ca. 1,000 ybp) had very different diets.
Indian Knoll

foragers
c.a. 5,000 ybp

- people ate large quantities of river mussels and snails
- and deer, small mammals, wild turkeys, box turtles, fish, and occasionally dog

Hardin Village
agriculturalists
c.a. 1,000 ybp

*The Cultural Feast, 2nd Ed.*, p. 54
Indian Knoll

foragers
ca. 5,000 ybp

• similar sites suggest they also ate hickory nuts, walnuts, acorns, elderberries, persimmons, sunflower seeds, and other wild berries

Hardin Village

agriculturalists
ca. 1,000 ybp

*The Cultural Feast, 2nd Ed.*, p. 54
Indian Knoll
foragers
ca. 5,000 ybp

Hardin Village
agriculturalists
ca. 1,000 ybp

- people relied primarily on cultivated **corn, beans, and squash**
- **supplemented** with deer, eel, small mammals, wild turkeys, box turtles, and wild plants

*The Cultural Feast, 2nd Ed.*, p. 54
Claire Cassidy (1980)

• compared 296 skeletons from Hardin Village and 285 skeletons from Indian Knoll in Kentucky

• data on health was derived from careful analysis of the bones and teeth . . .

*The Cultural Feast, 2nd Ed.*, p. 54
Indian Knoll

- foragers
- ca. 5,000 ybp

Hardin Village

- agriculturalists
- ca. 1,000 ybp

• life expectancies **for both sexes at all ages were lower at Hardin Village**
Indian Knoll
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The Cultural Feast, 2nd Ed., p. 54
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- iron-deficiency anemia of sufficient duration to cause bone changes was absent at Indian Knoll
- but was present at Hardin Village
  - 50% of cases occurred in children under 5

*The Cultural Feast, 2nd Ed.*, p. 54
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The Cultural Feast, 2nd Ed., p. 54
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- **growth arrest episodes** at Indian Knoll were periodic and more often of short duration and were possibly due to food shortages in late winter.
- those at Hardin Village occurred randomly and were more often of long duration, probably indicative of disease as a causative agent.

*The Cultural Feast, 2nd Ed.*, p. 54
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_The Cultural Feast, 2nd Ed., p. 55_
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ca. 1,000 ybp

• more children suffered infections at Hardin Village
Hardin Village

- the syndrome of periosteal inflammation
  - a swelling of the outermost layer of the bone

Indian Knoll

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*The Cultural Feast, 2nd Ed.*, p. 55
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- decay was unusual at Indian Knoll and abscessing occurred later in life because of severe wear to the teeth

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The Cultural Feast, 2nd Ed., p. 55
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Hardin Village
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• the differences in tooth wear rate and carries rate are very likely attributable to dietary differences between the two groups

The Cultural Feast, 2nd Ed., p. 55
Indian Knoll
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• lower infant mortality
• no iron-deficiency anemia
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• fewer infections
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and the winner . . .

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ca. 1,000 ybp

The Cultural Feast, 2nd Ed., p. 55
Cassidy concluded that the agricultural Hardin Villagers were less healthy in his opinion most of the health conditions were related to dietary factors especially the lack of animal protein in the agriculturalists’ diet.

The Cultural Feast, 2nd Ed., p. 55
Indian Knoll

foragers

ca. 5,000 ybp

Hardin Village

agriculturalists

ca. 1,000 ybp

• A.H. Goodman and G.J. Armelagos (2000) draw similar conclusions from the remains at neighboring Dickson’s Mounds in Illinois


*The Cultural Feast, 2nd Ed.*, p. 55
“Mississippi Culture”  
A.D. 800 to ca., 1200  
pop. 600-1170
Ch. 4 “The Edible Earth: Managing Plant Life for Food” raises the question “Why did they bother?”
“Why did they bother?”
That’s a very good question . . .
What do you think?
the consequences of “Neolithic” (food production) activities included

- new settlement patterns
- new technologies
- profound biocultural effects
and the agricultural revolution in all parts of the world usually included . . .

- population growth
- establishment of large, sedentary villages
  - opportunity for increased social interaction
- but with added health risks

*The Cultural Feast, 2nd Ed.*, p. 55
Hardin Village
agriculturalists
ca. 1,000 ybp

Indian Knoll
foragers
ca. 5,000 ybp

• despite a higher incidence of malnutrition and disease in the agricultural population, domestication of plants and animals was associated with population growth.
Hardin Village

• “Hardin Village, like millions [sic.] of agricultural communities, increased significantly, growing from 100 to 300 people over a 150-year period”

The Cultural Feast, 2nd Ed., p. 55
“Thus, although overall health was poorer, food production allowed a much larger population to live together than the previous way of life could sustain.”

The Cultural Feast, 2nd Ed., p. 55
Biocultural Consequences: Population

- people clustered into villages
- women had more children
- even early settlements quickly reached considerable size
Social and Political Consequences of the Agricultural Revolution

• population growth

• establishment of large, sedentary villages
  • opportunity for increased social interaction

• but with added health risks

*The Cultural Feast, 2nd Ed.*, p. 55
at Tehuacán, Mexico
(see Tehuacán slide set for details)

<table>
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<tr>
<th>Era</th>
<th>Region</th>
<th>Activities</th>
<th>Population Range</th>
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<tr>
<td>Palo Blanco (200 B.C. - A.D. 700)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Ajalpán and St. Maria (1500 - 200 B.C.)</td>
<td>Ceremonial centers or villages with temples with ceremonially affiliated villages (100-300 village population)</td>
<td>Full-time agriculture using many hybrid domesticates; irrigation (?)</td>
<td>One hundred fifty times original population (1800 - 3600)</td>
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<td>Late Abejas, Purrón, and maybe early Ajalpan (3,000 - 1500 B.C.)</td>
<td>Semipermanent villages composed of a number of microbands; pithouse village (?)</td>
<td>Full-time agriculture planting an increasing amount of domesticates</td>
<td>Forty times original population (480 - 960)</td>
</tr>
<tr>
<td>Coxcatlán and and early Abejas phases (5000 - 3000 B.C.)</td>
<td>Semisedentary microbands migrating by season but frequently</td>
<td>Plant collectors doing an increasing amount of agriculture due to</td>
<td>Ten times original population (120 - 240)</td>
</tr>
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Social and Political Consequences of the Agricultural Revolution

- population growth
- establishment of large, sedentary villages
  - opportunity for increased social interaction

- but with added health risks
early food producers faced health risks due to close proximity to domesticated animals

- dogs carry rabies
- horses carry tetanus
- pigs and poultry carry influenza
- AIDS was derived from chimpanzees
Biocultural Consequences: Diet and Health

- early food producers faced health risks due to close proximity to . . .
  - larger numbers of other humans
Biocultural Consequences: Population

around the world
population size and density increased with the agricultural revolution
World population growth
Biocultural Consequences: Population

useful terms:

**demographic increase**

pertains to the size or rate of increase of human populations
Biocultural Consequences: Population

useful terms:

**carrying capacity**

is the population the environment can sustain
one of the best known Mississippian sites is the city of Cahokia near Collinsville, Illinois, not far from Indian Knoll and Hardin Village. Cahokia was the largest pre-Columbian city in North America...
“In the 12th century [Cahokia] was as large as London!”

“It was the largest city in America until Philadelphia outgrew it in 1800!”

http://www.meredith.edu/anth/anth2106.htm

Cahokia
William R. Iseminger
Cahokia Mounds State Historic Site
Collinsville, Illinois
"Community Life" at Cahokia

Michael Hampshire
Cahokia Mounds State Historic Site
Collinsville, Illinois
Woman Grinding Maize
Cahokia Mounds State Historic Site
Collinsville, Illinois
Cahokia, Illinois

A.D. 600 – 1400
2,200 acres
pop. 8,000 - 40,000

http://en.wikipedia.org/wiki/Cahokia
and at Cahokia, as elsewhere, compared to hunting/gathering/foraging agriculture and its concomitant sociocultural changes are not particularly healthy . . .
and as cities become as large as Cahokia, with a population of from 8,000 - 40,000 (depending on the timeframe) — as compared with a small village like Hardin Village, with 100-300 people — the problems with water safety, waste disposal, caring for the deceased, food security, infectious diseases, and the like, multiply exponentially . . .
“Mississippi Culture”
A.D. 800 to ca., 1200
pop. 600-1170

and the same was true even with small cities like around
Dickson Mounds, in Illinois, with an estimated population between
600-1200 people — problems with water safety, waste disposal,
food security, infectious diseases, nutritional deficits, and the like,
become major problems not present in the same way in
hunting/gathering/foraging societies
and so for all these reasons, and more . . .

in the health and welfare contest
the winners will usually be . . .
and so for all these reasons, and more . . .
in the health and welfare contest
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foragers

• better life expectancies
• lower infant mortality
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• growth arrests periodic and short
• fewer infections
• less bone inflammation
• less tooth decay and abscessing
• and a whole lot more . . .

agriculturalists
and it’s a first round knockout when comparing traditional hunters and gatherers with modern sedentary Homo sapiens sapiens . . .

foragers

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foragers

agriculturalists

http://www.topnews.in/neanderthals-might-have-been-wiped-out-due-cannibalism-222988
http://mybroadband.co.za/vb/showthread.php/121380-Michelangelo-s-David