

BIOLOGICAL ANTHROPOLOGY 141
The Evolution of Human Diet
Fall 2016
Mandeville B-150

Class: T, Th 2:00-3:20

Instructor: Dr. Margaret J. Schoeninger

Office hours: Thursday, 11-12 in SSB 266 or by appointment

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Final exam: Thursday December 8 3-6 pm

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ANBI 141 is an upper division lecture course that asks: "What are we supposed to eat?" to eat well and live right? We have the genotype of our ancestors who lacked agriculture and animal domestication, yet our food economy is based largely on cereals like wheat, rice, corn and barley. The fossil record indicates that our early ape-like ancestors ate largely fruit and leaves just a living nonhuman primates do today. By 1.8 million years ago, however, Homo erectus looks similar to us from the neck down and the data indicate that they were hunting or scavenging as well as gathering plant foods. The change from the ancestral diet to meat-eating involves a dietary change from simple sugars, complex carbohydrates and plant proteins to diets that include animal fat and protein. A later transition to agriculture involved another major shift to the present-day dependence on cereals and some root crops. Does our innate diet rely on fat and meat or on carbohydrates as energy and on animal or plant protein? This course will consider evidence from living primates, fossil primates, modern human foragers and bone chemistry to address the implications for our modern situation.

Course requirements:

Midterm: 30% **Tuesday Nov. 1** in class will cover week 1-5 Open Book

Paper: 20% Read: **Thayer, Zaneta M. and Christopher W. Kuzawa (2011)**

Biological memories of past environments: epigenetic pathways to health disparities. Epigenetics 6 (7):798-803. First paper in your reader.
5 pages single space in total, 2 Sections.

I. (2 pages total): summarize the **Thayer and Kuzawa** paper. It is a review article and there are several sections to it.

II (3 pages total): Page 799 of Thayer and Kuzawa has a section titled: Nutritional Stress. It refers to 25-30 original research papers. Pick one of these, read it thoroughly, and write a 3-page summary of the overall topic, its conclusions, and its relevance in your opinion. Your opinion section should cover **1/2 page at most**.

Your paper is due Nov. 10 in class. Bring a paper copy.

Your paper will be reviewed and returned to you. You will have the option of rewriting after you have read the comments.

If you chose to rewrite, the paper is due in class on the last day of class.

Project 20%: Food Journal - description on TritonEd

Final exam: 30% The final exam will be cumulative in terms of relying of what you studied weeks 1-5 in order to answer questions about weeks 6-10.

Academic Integrity: Students are expected to do their own work, as outlined in the UCSD Policy on Academic Integrity published in the UCSD General Catalog. Cheating will not be tolerated, and any student who engages in suspicious conduct will be confronted and subjected to the disciplinary process. Cheaters will receive a failing grade on the assignment or the exam and/or the entire course. They may also be suspended from UCSD.

NOTE: Both reading and lecture materials will be tested on the exams.

SCHEDULE

WEEK	DATES	TOPIC
	Sept. 22	Introduction – course mechanics
		Thayer, Zaneta M. and Christopher W. Kuzawa (2011) Biological memories of past environments: epigenetic pathways to health disparities. <i>Epigenetics</i> 6 (7):798-803.
1	Sept. 27 & 29	Natural Primate Diet (nonhuman)
		Gaulin, JC and Konner M (1977) On the natural diet of Primates, including Humans. In: Wurtman, RJ and Wurtman, JJ (eds) <i>Nutrition and the Brain</i> , Vol. 1 New York, Raven Press. Pages: 1-39.
		Hernandez-Aguilar, RA, Moore, JJ, and Pickering, TR (2007) Savanna chimpanzees use tools to harvest the underground storage organs of plants. <u><i>Proceeding of the National Academy of Sciences</i> 104:19210-19213.</u>
2	Oct. 4 & 6	Natural Human Diet
		Gaulin, JC and Konner M (1977) On the natural diet of Primates, including Humans. In: Wurtman, RJ and Wurtman, JJ (eds) <i>Nutrition and the Brain</i> , Vol. 1 New York, Raven Press. Pages: 39-74.
		McGrew WC (2014) The 'other faunivory' revisited: Insectivory in humans and non-human primates and the evolution of human diet. <i>Journal of Human Evolution</i> 71:4-11.
3	Oct. 11 & 13	Paleolithic Nutrition: AKA PaleoDiet
		Eaton SB, and Konner M (1985) Paleolithic Nutrition. <i>New England Journal of Medicine</i> 312:283-289.
		Eaton SB et al. (1996) An evolutionary perspective enhances understanding of human nutritional requirements. <i>Journal of Nutrition</i> 126:1732-1740 .

4

Oct. 18 & 20

Digestion&Plant Chemistry

Lambert, JE and Rothman, JM 2015 Fallback foods, optimal diets, and nutritional targets: Primate responses to varying food availability and quality. *Annual Review of Anthropology* 44: 493-512.

Ley et al. (2008) Evolution of Mammals and Their Gut Microbes. *Science* 320: 1647-1651.

Schnorr et al. (2014) Gut microbiome of the Hadza hunter-gatherers. *Nature Communications* 5 (3654):1-12.

5

Oct. 25 & 27

**Diet Reconstruction:
Teeth, stable isotope analysis**

Schoeninger MJ (2014) Stable Isotope Analyses and the Evolution of Human Diets. *Annual Reviews of Anthropology* 43:213-230.

Ross, Callum F. and Iriarte-Diaz, Jose (2014) What does feeding system morphology tell us about feeding? *Evolutionary Anthropology* 23:105-120.

Scott, Robert S, Teaford, MF, and Ungar, PS (2012) Dental microwear structure and anthropoid diets. *American Journal of Physical Anthropology* 147:555-579.

6

Nov. 1 & 3

Primate Origins

MIDTERM TUESDAY NOV 1 IN CLASS.

Sussman, RW, Rasmussen, DT, Raven, PH (2013) Rethinking primate origins. *American Journal of Primatology* 75:95-106.

Merceron et al. (2009) Folivory or fruit/seed predation for *Mesopithecus*, an earliest colobine from the late Miocene of EuroAsia? *Journal of Human Evolution* 57:732-738.

Ungar PS. 1996. Dental microwear of European Miocene catarrhines: evidence for diets and tooth use. *Journal of Human Evolution* 31:335-366.

7 **Nov. 8 & 10** **The Human Family: Early Hominins**
PAPER DUE NOV 10 IN CLASS. BRING PAPER COPY.

Cerling, TE et al. (2011) Diet of *Paranthropus boisei* in the early Pleistocene of East Africa. *Proceedings of the National Academy of Sciences US* 108:9337-9341.

Marlowe FW and Berbesque JC (2009) Tubers as fallback foods and their impact on Hadza hunter-gatherers. *American Journal of Physical Anthropology* 140:751-758.

Henry et al. (2012) The diet of *Australopithecus sediba*. *Nature* 487:90-93.

Ungar P, Grine F, and Teaford M. (2008) Dental microwear and diet of the Plio-Pleistocene hominin *Paranthropus boisei*. *PLOS ONE* 3(4):e2044
doi:2010.1371/journal.pone.002044.

8 **Nov. 15 & 17** **The Human Family: Human Origins**

Wrangham, et al. (1999) The raw and the stolen: Cooking and the ecology of human origins. *Current Anthropology* 40:567-594.

Gibbons A. 2008. The birth of childhood. *Science* 322:1040-1043.

Lee Thorp JA, Sponheimer M, and Luyt J. 2007. Tracking changing environments using stable carbon isotopes in fossil tooth enamel: an example from the South African hominin sites. *Journal of Human Evolution* 53:595-601.

Marlowe FW. 2003. A critical period for provisioning by Hadza men Implications for pair bonding. *Evolution and Human Behavior* 24:217-229.

9 **Nov. 22 & 24** **Human Foods**

Henry AG, Brooks AS, and Piperno DR (2011) Microfossils in calculus demonstrate consumption of plants and cooked foods in Neanderthal diets (Shanidar III, Iraq; Spy I and II, Belgium). *PNAS* 108(2):486-491.

