

Peer Review

Review of: "Dietary Heritages at the Dawn of Humankind in Sub-Saharan Africa"

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The review aims to address ancient diets and technological advancements in food preparation. This is a highly relevant topic as this reviewer is unaware of efforts to review the archaeological knowledge of Neolithic or pre-Neolithic diets. For the former, a substantial body of archaeological evidence is available; this reviewer is less aware of the archaeological evidence pertaining to the latter. The scope of the review is poorly defined, however. The title mentions the “dawn of humankind,” which relates to a timeline of more than 10,000 to more than 200,000 years ago. The abstract refers just to “ancient diets and technological advancements in food preparation” without mentioning the actual scope. The scope should be clearly defined as “pre-historic” (i.e., related to archaeological evidence) or “pre-Neolithic” (i.e., pre-dating the agricultural revolution).

Information on the timelines of human evolution is scattered throughout the manuscript – a section providing the timelines (evolution of hominids, evolution of Homo sapiens, beginning of agriculture in Sub-Saharan Africa) would be extremely helpful.

The narrative fairly consistently includes a narrative that pertains both to contemporary non-industrialised societies and to pre-historic societies for which information is based only on archaeological findings. A focus on the former would necessitate a detailed history of food technology to live up to the scope mentioned above; a focus on the latter necessitates deletion of most of the references to contemporary societies.

The manuscript should emphasise more clearly that a single “ancient diet” does not exist – over time, humans ate hundreds or thousands of different “ancient diets” depending on the organisation of their society and the climatic conditions. This is not clearly acknowledged in the manuscript.

Overall, the manuscript refers to paleofaeces and the archaeological record as sources of information on pre-historic diets but is very light on presenting these artefacts and the conclusions that can be drawn

from them. A more comprehensive and more detailed description of archaeological artefacts that inform on the diet, e.g., in a table or in additional figures, would be extremely helpful.

The manuscript can be condensed substantially by reducing unnecessary wordiness and by deleting rather trivial statements that are out of scope, e.g., the statement that “this evolution provides us with vital clues about the origin of life” or that “Food and beverages are deeply ingrained in different cultures connecting nutrition and health, rituals...”.

The term “ultra-processed” or “highly processed” is not used critically. First, the concept of linking health outcomes to processing is highly contested, partially contradicted by some ultra-processed foods that consistently correlate with beneficial health outcomes, and firmly rejected by many in the field. Second, the lifestyle and diet changes that resulted in an increase in non-communicable diseases occurred only in the last 100–200 years and are almost certainly out of scope.

Specific comments.

Page 2, last paragraph: Food technology has arguably decreased food safety and quality. The much-contested term “ultra-processed” links poor nutritional status and a reduced life expectancy to the use of refined ingredients and additives, but this is a recent change and not something that occurred in the “dawn of humankind” or during the Neolithic revolution.

Page 3, first paragraph: again, the term “highly processed” and its relevance for human nutrition are contested.

Page 3, genomes mutate; the diet does not. Mutations of the human genome that relate to diet (at least 3 are described: bitter taste receptor, lactase persistence, and the copy number of the salivary amylase) are mentioned, but these are not presented.

Page 3, last paragraph, and page 4, first paragraph: most of the concepts described here pertain to agricultural, highly organised societies but not to earlier hunter-gatherer groups.

page 4, second paragraph. As a consequence of eating cooked starch, humans became the only hominid species with multiple copies of the saliva amylase.

page 4, last paragraph. “indigenous and local knowledge” do not inform on the diet at the dawn of humankind. Irrespective of the relevance of indigenous knowledge for sustainable food systems, this knowledge is unlikely to inform on the diet in pre-neolithic societies.

page 5, second / third paragraph. It is indeed difficult to reconstruct ancient diets – a comprehensive and concise description of the evidence that is available from archaeological findings (tools, food) or

coprolites would help. The manuscript does the task only partial justice by referring to very few studies that describe archaeological artifacts.

Page 5. Again, the concepts “religion, disability, sexual orientation, socioeconomic status, education, marital status, and ideologies” are very unlikely to pertain to most or all pre-agricultural societies.

page 5 last paragraph. Please provide more detail on the evidence provided by paleofaeces and coprolites.

page 6, “native smallholder food system” is a term that pertains to agricultural societies but not to pre-neolithic societies.

page 7. If the “study of Palaeolithic diet, with no cereals, milk and legumes, is perhaps the most critical component of research on past populations” then why are not more results from such studies presented and discussed?

page 10 last paragraph: Who is “they” that had less sharp premolars?

page 12, section on insects. If there is no archaeological record of pre-neolithic insect consumption, then this section can be a lot shorter?

Section 3.4. The section on drinking water can be omitted – water was probably the only beverage until the first beer was brewed about 14,000 years ago.

Section 3.5. Geophagy. As section on insects.

line 19. “allergic to wheat and gluten”. Wheat allergies, celiac disease, and non-celiac gluten intolerance are relatively complex issues that are not readily fixed by a return to a paleolithic diet, but the manuscript currently does not present the state of the discussion – omit.

Section 5, microbiota. Multiple excellent studies provide a detailed and fairly consistent overview of how the shift from hunter-gatherer societies to pre-industrial societies and the further shift to developed and industrialised societies has shaped our gut microbiome, how lifestyle and diet contribute to this shift, and what the (potential) consequences of this shift are. None of the current discussion is reflected in this section.

Likewise, human genetic mutations that relate to the diet (see above) are not mentioned at all.

The manuscript does not present any of the available science; preferably, this section is to be deleted or condensed very substantially.

Declarations

Potential competing interests: No potential competing interests to declare.