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ORIGINAL RESEARCH

Animal-based foods and human health throughout evolution - A review of the evidence

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1. ABSTRACT

The analyzed study reconstructs, in a narrative form, some major changes in human diet throughout evolution. The part relevant to the book's section concerns the transition to agricultural production that began approximately 10,000 years ago: according to the author, the increased reliance on cultivated grains and the lower consumption of meat were associated, in ancient human remains, with more dental problems, signs compatible with iron-deficiency anemia, infections, and bone loss.In section 1.1.3 of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi, the publication thus contributes to the narrative that some ancient agricultural populations showed a worsening of archaeological health indicators. Independent studies on Neolithic communities support the existence of greater biological pressures in specific agricultural contexts, including growth stress, increased exposure to diseases, and an increase in certain dental pathologies. However, other studies do not detect a uniform dental deterioration. The most prudent conclusion is that the agricultural transition may have increased certain health risks, but with different effects depending on location, period, foods consumed, and living conditions.

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MISSION

LIFE Science Hub – Journal of Science was founded with the aim of making scientific knowledge accessible without giving up methodological rigour, quality of sources and authoritativeness of content. The journal promotes the dissemination of knowledge in the health, nutrition, medical and longevity sciences, building a bridge between the world of research and society.

Through articles, reviews, in-depth analyses and expert contributions, the Journal champions evidence-based medicine and science, fostering a correct interpretation of scientific data and countering misinformation. Every piece of content is developed with the aim of translating the complexity of research into understandable, useful and applicable information, while keeping intact the principles of accuracy, transparency and scientific independence.

Free from political, industrial and commercial influence, the journal stands as an authoritative and independent editorial space, dedicated to promoting scientific culture, professional development and the growth of health awareness among the public.

2. ANALYZED STUDY

The research question was how the consumption of animal-based foods, especially meat, changed during human evolution and what consequences these changes may have had on health. The hypothesis discussed is that the transition from hunting and gathering to a diet based more heavily on domesticated grains narrowed dietary variety and coincided with a worsening of certain indicators observable in skeletal remains.The relevance to paragraph 1.1.3 of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi is precise: the study is referenced for the passage describing more frequent cavities, dental occlusion alterations, signs attributed to iron-deficiency anemia, infections, and bone tissue loss following the advent of agriculture. The analyzed study can support this general archaeological framework; however, it cannot prove that cultivation, grains, or the reduction of meat were the sole cause of each observed lesion.Since the available material is only the abstract, it is not possible to verify in detail how the author selected the specimens, populations, or studies cited in the summary.

3. MATERIALS AND METHODS OF THE ORIGINAL STUDY

The publication is a narrative synthesis of evolutionary history, archaeology, and human health, not a clinical study or an experiment on contemporary participants. The abstract describes three major phases: the opportunistic acquisition of meat before 2 million years ago; the subsequent increase in cooperative hunting of large animals; and the transition from hunting and gathering to food production, which began approximately 10,000 years ago.The author links this last phase to the archaeological examination of human remains from different regions of the world. The variables mentioned include dental health, malocclusion, skeletal signs interpreted as iron-deficiency anemia, infection, and bone loss. The number of specimens, the archaeological sites included, the selection criteria, the lesion assessment techniques, the statistical analyses, and any control for alternative factors are not reported in the available material.This approach is useful for proposing an overview, but it does not allow for the estimation of a quantitative effect of agriculture on health, nor does it allow for the clear separation of the role of diet from that of sedentary lifestyle, overcrowding, increased exposure to pathogens, physical labor, and environmental conditions.

4. RESULTS

The central finding relevant to the book is descriptive: according to the author's summary, the transition to a diet more focused on domesticated grains and lower meat consumption was accompanied, in the archaeological record, by a decline in health. The indicators listed include worsening dental health, more occlusal anomalies, more signs interpreted as iron-deficiency anemia, more infections, and bone loss.In plain terms, the claim is that some skeletons and teeth from ancient agricultural populations show more traces of biological stress or disease compared to what is observed in other pre-agricultural contexts. However, the abstract does not report absolute values, percentages, confidence intervals, statistical significance values, or quantitative comparisons between groups. It is therefore not possible to establish from the available material how large the differences were, in which regions they were most marked, or whether they were constant over time.The abstract also attributes some risks of contemporary societies to sedentary lifestyles and excessive consumption of high-fat foods. This passage is not the reason why the publication is cited in the book's paragraph and does not constitute the focus of this review.

5. INTERPRETATION

The biological significance of the publication is that agricultural production did not just change the menu: it also changed the way of life. More stable and larger communities could rely more heavily on a few crops, live in closer proximity, and face new labor demands. All these factors can influence teeth, skeletal growth, and vulnerability to infections.The segment actually documented by the analyzed study is therefore: transition towards agriculture and a diet more focused on cereals presence, in various archaeological series, of more indicators of poor health. The connection does not equate to proving a single chain of the type "less meat causes anemia, infections, and bone loss." Bone lesions are, in fact, indirect indicators: a lesion

can have multiple causes and, in particular, some cranial signs traditionally associated with anemia do not allow for a certain diagnosis on their own.Regarding the narrative of "The Choice to Live in Health or Illness" by Dr. A. Colonnese and R. Panzironi, the scientific correspondence is therefore present at a historical-archaeological level. The strength of the causal inference remains limited because the available publication does not provide complete methodological details and because diet, infections, population density, and physical labor were closely intertwined in early agricultural societies.

6. INDEPENDENT CONFIRMING EVIDENCE

Bioarchaeological research conducted at Çatalhöyük, a large Neolithic settlement in Anatolia dating between 7100 and 5950 BC, confirms the passage in the book regarding the potential deterioration of health conditions due to sedentary lifestyles and dependence on domesticated plants. By examining human remains and the archaeological context over a period of nearly 1,200 years, the authors reported higher biological costs associated with community life, including greater exposure to disease and increased labor demands, in relation to population growth, housing density, and reliance on domesticated plant carbohydrates [1]. This is direct confirmation of the plausibility of the general framework, but it concerns a single site and does not allow for isolating the contribution of cereals alone.A broad comparison of skeletal remains from Central and Southeastern Europe has provided independent evidence regarding the stress of early agriculture. The authors observed that Neolithic farmers had, on average, reduced stature, body mass, and lower limb proportions compared to late Mesolithic hunter-gatherer-fishers and later agricultural populations [2]. For the reader, this suggests less favorable growth conditions in some early farming communities. However, the study does not prove that the change depended exclusively on the nutritional quality of the diet: physical activity, infections, social inequalities, and variable access to resources may also contribute.A third study examined seven oral indicators in eleven skeletal samples from Southeastern Arabia, from the late Neolithic to the Bronze Age. In populations of the Umm an-Nar horizon, compared to older groups, cavities, lesions around the roots, and tooth loss before death increased; values were higher in inland groups compared to coastal ones [3]. This result specifically confirms the part of the narrative regarding the potential increase in dental pathologies with a greater importance of crops. The difference between the coast and the interior, however, shows that marine resources, local dietary practices, and other factors could significantly modify the effect.Taken together, these studies support a convergent but non-linear chain: changes in subsistence and sedentary life can be associated with greater biological stress, while the manifestations observable in teeth and bones vary from population to population. None of them directly demonstrate, for all ancient agricultural communities, the presence of iron-deficiency anemia or a reduction in bone mineral density.

7. CONFLICTING EVIDENCE

A comparison between Natufian hunter-gatherers and Neolithic populations of the Southern Levant challenges the idea of inevitable dental deterioration following the advent of agriculture. The study evaluated 1,160 Natufian teeth and 804 Neolithic teeth. Caries rates were low and very similar in both groups, 6.4% in Natufians and 6.7% in Neolithic populations; periapical lesions and tooth loss before death were also similar [4].This result is directly relevant because it indicates that the transition from hunting and gathering to food production did not necessarily lead to an increase in dental pathologies in every region. The authors suggested that food consistency, preparation techniques, and the use of teeth as tools contributed to the observed differences. No directly conflicting evidence sufficiently relevant to all other indicators mentioned in the book, such as bone infections, anemia, and bone tissue loss, has been identified; this does not prove the absence of contrary findings.

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

The table distinguishes the original synthesis from independent research and shows that the archaeological picture is convergent, but not uniform.

Quadro comparativo

Reference	Study type	Population or model	Main result	Direction of evidence	Strength of evidence
Original study	Archaeological-evolutionary narrative synthesis	Archaeological human remains from various regions, sample size not reported	Associates the transition to agriculture with more dental problems, signs of anemia, infections, and bone loss	biologically consistent evidence	preliminary
[1]	Observational bioarchaeological	Human remains from Çatalhöyük, Neolithic Anatolia	Dependence on domesticated plants, population density, and sedentary lifestyle coincide with greater disease exposure and labor demands	direct confirmation	moderate
[2]	Comparative observational bioarchaeological	Skeletal remains from Central and Southeastern Europe	Neolithic farmers show lower average stature and body mass than Mesolithic and later agricultural groups	indirect confirmation	moderate
[3]	Observational bioarchaeological	Eleven skeletal samples from Southeastern Arabia	In the Umm an-Nar horizon, caries, periapical lesions, and tooth loss increase, especially in the interior	direct confirmation	moderate
[4]	Comparative observational bioarchaeological	1,160 Natufian teeth and 804 Neolithic teeth from the Southern Levant	Caries, periapical lesions, and tooth loss are similar before and after the agricultural transition	discordant evidence	moderate

9. SINTESI EDITORIALE E CONCLUSIONI

CONCLUSIONS

The study analyzed pertinently supports the section of the book dedicated to the worsening of certain health indicators following the establishment of agriculture. Independent research confirms that, in various ancient communities, sedentary lifestyles, population growth, dependence on crops, and changed living conditions could coincide with greater biological stress and certain dental pathologies.However, this picture does not authorize a universal rule that agriculture always worsened health or that grains alone were responsible for the observed alterations. The evidence is moderately supported on an archaeological level and requires an interpretation that is attentive to the geographical, dietary, environmental, and social context of each population.

Aggiornato al 17/11/2026. Questo contenuto riflette una sintesi divulgativa delle evidenze scientifiche al momento della pubblicazione e non sostituisce il parere medico.

10. TRANSPARENCY AND SCIENTIFIC RESPONSIBILITY

Artificial Intelligence was used solely as a tool for editorial and documentary support. All content, interpretations, bibliographic citations and conclusions have been verified, reviewed and approved by the author, who assumes full scientific responsibility for them.

The manuscript was also subjected to independent peer review prior to publication.

To ensure the greatest transparency, the complete history of the article, including the dates of submission, revision, acceptance and publication, as well as information on the peer review process, is available on the dedicated Article History page.

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