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Title: Meat, fruit and vegetable consumption in sub-Saharan Africa: a systematic review and meta-regression analysis.

Authors:

Daniel O. Mensah[1*], Ana R. Nunes[1], Tahir Bockarie[1], Rob Lillywhite[2], Oyinlola Oyebode[1],

[1]Health Sciences Division, Warwick Medical School, University of Warwick, Gibbet Hill Campus, Coventry CV4 7AL, UK.

[2]Life Sciences Department, Warwick Medical School, University of Warwick, Gibbet Hill Campus, Coventry CV4 7AL, UK.

*__Correspondence__: d.mensah.2@warwick.ac.uk. Health Sciences Division, Warwick Medical School, University of Warwick, Gibbet Hill Campus, Coventry CV4 7AL, UK. Tel: 02476522644, Mobile: 07741180188.

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ABSTRACT

Context: The dietary choices we make affect our personal health and have consequences for the environment, both of which have serious implications for the 2030 Sustainable Development Agenda. In global reviews, the literature on meat, fruit, and vegetable consumption in sub-Saharan Africa (SSA) is limited.

Objective: This systematic review set out to quantify meat, fruit, and vegetable consumption in sub-Saharan African populations and to answer the question: How much meat, fruit and/or vegetables are being consumed daily which individuals in SSA over the years?

Data Sources: Following the PRISMA guidelines, we systematically searched MEDLINE, EMBASE, ASSIA CINAHL, Web of Science, POPLINE and Google Scholar to identify 47 (out of 5922 search results) studies reporting meat, fruit and/or vegetable consumption in sub-Saharan African populations.

Data Extraction: Three independent investigators extracted data on year of data collection, study country, study population and geographical context, and population intake of meat, fruit and/or vegetables.

Data Analysis: Using STATA SE version 15, random effects meta-regression analyses were used to test the effect of year of data collection and method of data collection on population meat, fruit, and vegetable consumption. We also tested any association between age, sex, urban/rural residence or a country's economic development, and population intake of meat, fruits and/or vegetables.

Key Findings: Richer SSA countries were likely to consume more meat (ß =36.76, p=0.04) and vegetables (ß =43.49, p=0.00) than poorer countries. Vegetable intake has increased dramatically over the last three decades from ≈10g to ≈110g (ß=4.43, p=0.00). Vegetable (ß=-25.48, p=0.00) consumption was higher in rural than urban residents. Daily average per capita meat consumption was around recommended 70g, while fruit and vegetable intake remain below WHO's recommendation. No clear differences in consumption were noticed between sexes.

Conclusions: Given the low intake of plant-based foods it is likely that SSA populations may be deficient in high quality protein and micronutrient as suggested by the EAT-lancet commission. There is the need for promoting both the adequate supply and demand of plant-based protein and micronutrients including fruit, vegetables, nuts, seeds and legumes in SSA countries. While dietary changes in SSA may offer the large absolute benefits, consideration of the magnitude of dietary change, particularly increasing or reducing meat consumption, will need to occur in a way

that ensures that policy and interventions support the reduction of under-nutrition and micronutrient deficiencies without worsening NCD prevalence and environmental impacts. There is also the need for preventive action that ensures that SSA populations do not increase their meat consumption as disposable incomes increase and countries' economic development rise as seen in most countries undergoing economic transformation.

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