INTRODUCTION

Consumed in many parts of the world, plantain chips are perceived to be a healthy alternative to potato chips or other greasy snacks due to their relatively high fibre and low sodium content. Typical of street foods, they provide an accessible and affordable source of nutrition for many people in low- and middle-income countries (LMICs), yet snack foods are significant sources of unhealthy fats including trans fatty acids (TFA) [1]. According to the USDA national nutrient database, the total fat per a serving of plantain chips (30g) is 8% representing about 27% of fat in 100g plantain chips [2]. In Ghana, food preparation practices including repeated usage of cooking oils [3] and frying foods at elevated temperatures [4] could induce formation of TFA in deep fried foods.

There is a growing public health concern about the consumption of foods containing TFA due to the established link with chronic disease morbidity and mortality [5]. WHO recommends that daily TFA intake be limited to less than 1% of total energy [6]. However, there is sparse scientific data on TFA levels in locally produced foods and intakes among Ghanaians. While much attention has been given to saturated fatty acids and their effect on non-communicable diseases (NCDs), equally critical is the levels of TFA in the Ghanaian diet and how much consumers are exposed to this type of fatty acids.

Our pilot study determined the amounts of TFA in a popularly consumed snack, plantain chips sold within the Accra Metropolitan Area (AMA) of Ghana and estimated intakes among regular consumers of this snack.

Research Questions

- Are there any TFA in plantain chips produced and consumed in the AMA? If yes, what types and levels of these fatty acids are present?
- How much TFA are consumed in plantain chips?
- What is the nutritional status (BMI, BF%) of regular consumers of plantain chips?
- Is there any association between BMI, BF% and TFA intakes?

METHODS/APPROACH

TFA was detected and quantified in 120 plantain chips samples randomly purchased from street vendors along the principal streets within the AMA. Fatty Acid Methyl Esters (FAME) was prepared according to ISO 12966-2:2017 and analyzed by Gas Chromatography Spectrometer with Flame Ionising Detector (FID) [7]. The TFA profile was calculated as the sum of acidic acid (I, C18:1), linoleic acid (I19:12, C18:2) and isomers of trans-1-oleinolic acid (I9,11:15-C18:3) [8]. A cross-sectional survey of 389 respondents aged 13 to 60 years was carried out to solicit information on TFA intakes. Height, weight and body fat (BF%) of each participant were measured. The WHO body mass index (BMI) principal cut-off: BMI ≥ 30.0 kg/m² [9], and a frequently used BF% cut-off: ≥25% in men and ≥35% in women for defining obesity were applied [8]. TFA intake was estimated as a product of the mean TFA concentration and the quantity of chips consumed in a day. Values were expressed as the average intake of TFA (as % of energy) based on a 2000kcal diet using the WHO recommended limit of 1% of energy as reference. A multiple regression was performed to predict BMI and BF% from TFA intake and other variables.

CONCLUSIONS

TFA contained in plantain chips are consumed at safe levels. Nonetheless, attention needs to be given to the health risks that accompany excessive consumption of this snack. General recommendations are that snacks high in fat and containing TFA be eaten in moderation. This research likely being the first of its kind in Ghana, it is hoped that the research contributes to filling the knowledge gap and informs future research.

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REFERENCES