Impact of extrusion on fruit/vegetable-millet blends on recovery of provitamin A and product physical properties

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ABSTRACT

In Senegal, interest in leveraging native plants as food ingredients for alleviating micronutrient deficiencies has grown simultaneously with the desire for new convenient forms of traditional products. Extrusion offers a cost effective path to generation of high quality instant thin and thick porridges from traditional grains. However, the extent to which extrusion can be applied to generate new micronutrient dense blended fruit/vegetable-cereal products has not been fully explored. To understand the impact of extrusion on quality attributes of instantized fruit/vegetable-cereal blends, micronutrient dense blended fruit/vegetable-cereal products have been fully explored. To understand the impact of extrusion on quality attributes of instantized fruit/vegetable-cereal blends, micronutrient dense blended fruit/vegetable-cereal products were evaluated.

PREPARATION OF EXTRUDED PRODUCTS

Preparation of Extruded products. Powdered carrot (CRT), papaya (PAP) and mango (MAN) were combined with whole grain (WG) or decorticated (DC) millet (25:75 %) and adjusted to ~30% moisture prior to extrusion on a Technochem Mini-Extruder® (9000 ppm; Final Temp: 87.9-115°C). A single-screw extruder was used to prepare the cereal blend. Impact of co-extrusion of cereal and fruits/vegetables on stability of provitamin A carotenoids and some physical properties were evaluated.

EXTRACTION AND PROVITAMIN A

Extrudates were extracted with acetone followed by Petroleum ether according to Ferruzzi et al. (2006) and Kean et al. (2008). Color. Color measurement was performed as described by Ndiaye et al. (2009). Phytochemical analysis Water solubility index and Water absorption index (WSI) expressed in dry basis were determined as described by Bovver and Campanella (2014) and Rodríguez-Miranda et al. (2011). Pasting properties were determined as described by Parada et al. (2011).

RESULTS

(a) Whole grain co-extrusion with CRT, MAN, and PAP powders

(b) Decorticated grain co-extrusion with CRT, MAN, and PAP powders

CONCLUSIONS & FUTURE WORK

• Highest carotenoid levels were observed for CRT blends (7442 ug/g DW) due to high starting material contents
• Greatest impact on final color increasing BI and C values (P<0.05) were observed for DC millet with CRT and PAP powders
• Reasonable recovery of provitamin A carotenoids is possible in extruded fruit/vegetable blends, however, the impact to physical and sensorial properties must be further explored.

REFERENCES


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