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EVALUATION OF PROXIMATE COMPOSITION OF COMPLEMENTARY FOOD FORMULATED FROM ASHA SEED AND SOY BEAN

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ABSTRACT

The study investigated the formulation of complementary food, comprising of Asha flour, and soy bean flour. The Asha flour and soy bean flour were substituted in ratio 50:50, 70:30, 80:20 respectively. The proximate compositions were analyzed using standard method. The result shows that sample A 50:50 has protein of 33.46±0.07, fat 29.23±0.04, carbohydrate 20.64±0.04, fibre 4.16±0.08, while B 70:30 has protein of 34.28±0.05, fat 29.20±0.01, carbohydrate 18.77±0.01, fibre 5.85±0.01 and sample C 80:20 has protein of 36.48±0.05, fat 26.84±0.07, carbohydrate 21.43±0.01, fibre 4.91±0.05. The result showed that 50:50 (SA) has the highest fat and moisture and kcal content (29.23 %), and (5.92 %) respectively. 70:30 (SB) has the highest fibre content and Ash content to be (5.85%), (6.52%) and 80:20 (SC) has the highest protein content and carbohydrate content . The Soya-Asha powder was very much preferred to ordinary soya powder because addition of Asha powder increases the protein content.

KEYWORDS: Asha Flour, Soybean Flour, Proximate Composition, Soy-Asha Powder, Asha Seed Powder.

INTRODUCTION

The infancy period is a “significant window” that promote optimal growth, health and behavioural development. At this stage children are vulnerable to poor nutrition; the growth rate during this period being greater than at any other stage, there thus exists an increased risk of growth retardation. Also, the immune system is not full-grown, which could result in a risk of frequent and severe infections. Therefore, adequate nutrition during infancy is highly imperative for development of a child to its full potential. This has made the formulation and development of nutritious complementary foods from local and readily available raw materials to meet considerable attention targeted towards meeting nutritional requirements of young children in both developed and developing countries.

Complementary foods are foods excluding breast milk or infant formula (liquids, semisolids, and solids) which are introduced to an infant to give nutrients (USDA, 2009).

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They are typically produced from foods which include roots; tuber; legumes such as soybeans, cowpeas; cereals such as wheat, maize and rice etc. (Akpapunam & Dedeh, 1995). According to the World Health Organization (WHO), complementary feeding is a process which commences from the stage at which breast milk becomes insufficient to meet the nutritional requirements of infants, which implies that other foods are needed alongside the breast milk (WHO, 2001).

These foods are therefore expected to be high in energy density, rich in protein, and contain the required vitamins and minerals and safe level of antinutritional components to enhance good health, nutritional status and growth of infants and young children during the period of rapid growth (Abeshu, Lelisa, & Geleta, 2016). However, for this reason many of the locally available raw materials are incorporated into these foods to meet the nutritional requirements and there is ongoing research on various composition and nutrient value of these raw materials in complementary foods.

Sesame (sesamum indicum L.), otherwise known as sesamum or benniseed commonly called asha, member of the family pedaliaceae, is a typical example of these raw materials. It is one of the most ancient oil seeds crop known to mankind which plays an important role in human nutrition. Most of the seeds are used for oil extraction and the rest are used for edible purposes (EL khier et al., 2008).

Also, Soybean meal (SBM) is another raw material used extensively as a protein source in animal nutrition. The characteristics that make it appealing are its desirable amino acid content, relative availability, high consistency and low cost compared to other high quality protein sources. Numerous factors impact the composition and quality of SBM, not the least of which is the quality of the soybean used to prepare the meal. It is vital that raw soybeans contain an optimal nutrient profile in order to produce the highest quality SBM. Because of the diversity of growing conditions within the United States and throughout the world, it is expected that soybeans produced under various environmental conditions would have varying nutrient compositions and qualities.

Therefore, the study was aimed to produce a complementary food from soybean and Asha (Benni seed) and analyzed its nutrient content.

MATERIALS AND METHODOLOGY

MATERIALS

Matured soybean seeds, was obtained at Oje market, Ede, Osun State and the Asha seed was obtained at kogi market at kogi state.

METHODS

The soy bean seeds was processed into powder, using the method of Ibanga and Oladele (2008). The process ensures effective removal of stone and other foreign material that may affect the quality of the final product. The sorted seed was boiled for 20 minutes in order to remove the activities of tipsin inhibitor and other anti nutritional component of the seed. The boiled seed was dehulled and washed with clean water and then dried in a cabinet dryer at 70^0C for 24 hours, after which was mixed with commercial attrition milling machine. The milling soya powder was then sieved to obtain fine powder using 0.25mm aperture sieve.

Asha seed was processed into powder. The process ensures effective removal of stone and other foreign materials that may affect the quality of the final product. The sorted seed was windowed and then washed with clean water and then dried in a cabinet or oven dryer at 80^0C for 1 hour, after which was then milled with commercial attrition milling machine. The milled Asha was then extracted (using centrifugation method) and was decanted. The decanted

powder was then over dried again. The dried seed was served to obtain fine powder using 0.25mm aperture seive.

The proximate composition of the complementary food was determined according to the standard method of AOAC 1984. The result was subjected to SPSS version 23 for further arithmetically analysis.

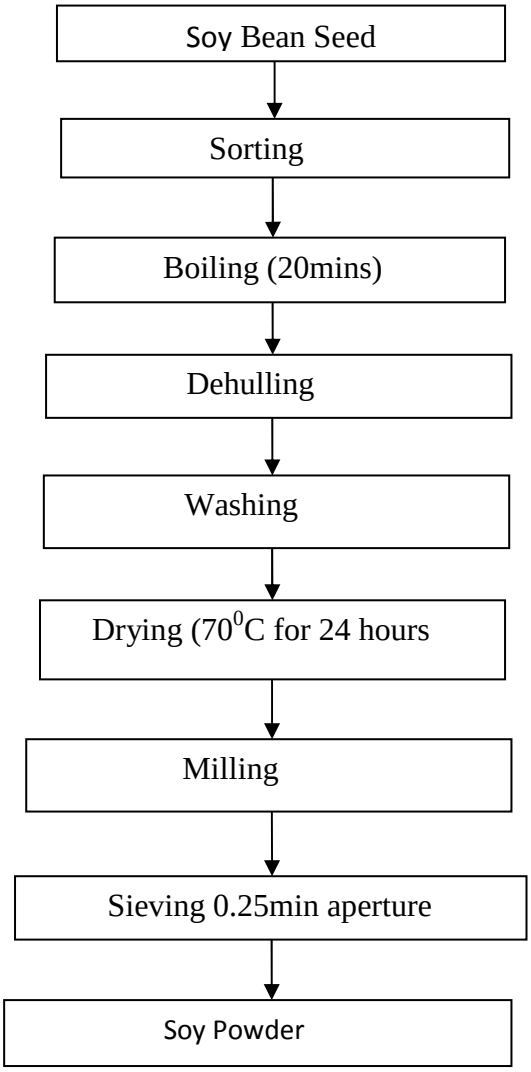

Figure 3.1.Flow Chart for the Preparation of Soy Powder Source: (Ibanga and Oladele, 2008) modified

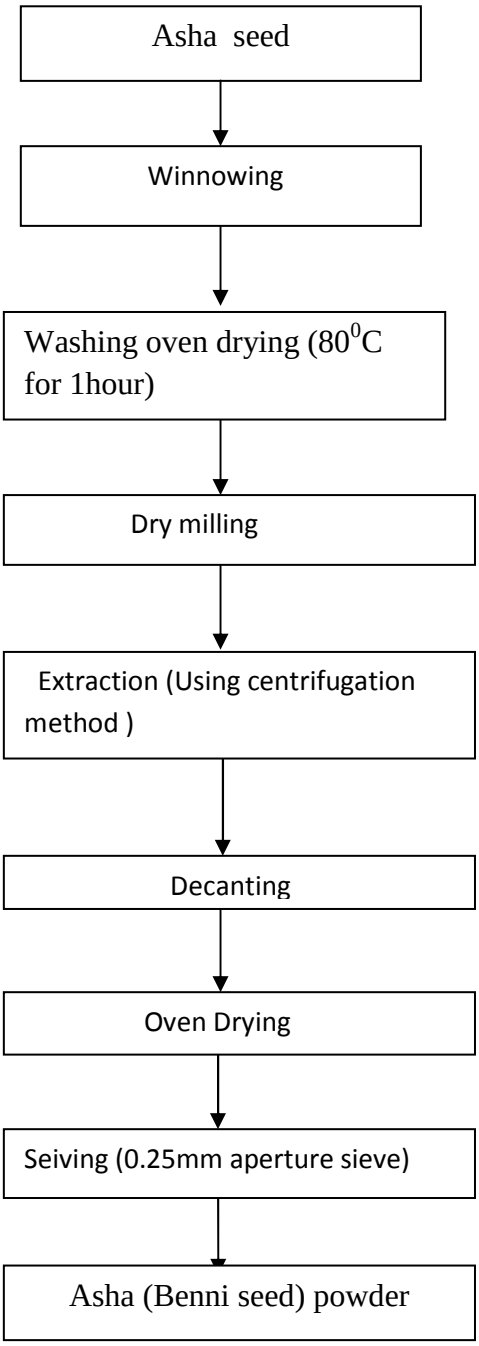

Fig 3.2.Flow chart for the preparation of production process of Asha (Benin seed) powder

ASHA POWDER AND SOY BEAN POWDER FORMULATION

PEW 1: 50 % SP: 50 % AP

PEW 2: 70 % SP: 30 % AP

PEW 3: 80 % SP: 20 % AP

KEY

S P=Soy Powder, A P=Asha Powder.

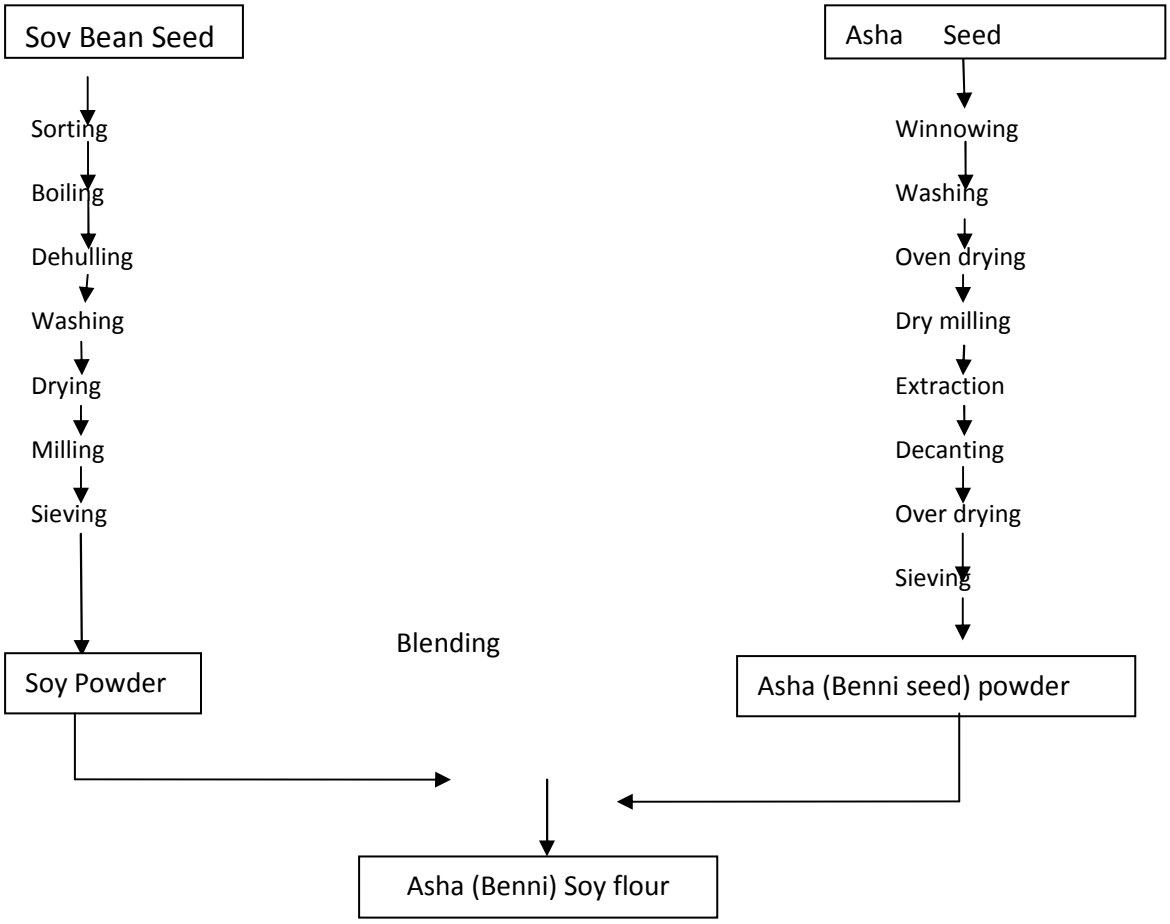

Fig 3.3.Flow Chart for the Preparation of Asha Soy Powder

RESULT AND DISCUSSION

Table 1.Proximate composition of a complementary food produced from asha – soy bean powder

PARAMETERS	A	B	C
PROTEIN	33.46 ± 0.07	34.28 ± 0.05	36.48 ± 0.05
FAT	29.23 ± 0.04	29.20 ± 0.01	26.84 ± 0.07
FIBRE	4.16 ± 0.08	5.85 ± 0.01	4.91 ± 0.05
ASH	5.81 ± 0.01	6.53 ± 0.01	6.04 ± 0.02
MOISTURE	5.92 ± 0.05	5.46 ± 0.07	4.16 ± 0.01
CARBOHYDRATE	20.64 ± 0.04	18.77 ± 0.01	21.43 ± 0.01
KCAL	479.5 ± 0.04	475.0 ± 0.01	473.3 ± 0.07

The mean result of proximate composition in the samples A, B, and C ranges from 33.46, 34.28, and 36.48 for protein Table 1. The result of the proximate analysis of the complementary feeding produced from Asha and soy bean revealed that the protein content of the sample A,B and C in ratio 50:50 70:30 and 80:20 has higher protein value than what Onoja, *et al*., 2014 earlier reported that he's own complementary foods has the protein value of 10:46. They also is in relation to the result that it's a good source of protein which can be used to maintain or manage protein energy malnutrition in children (Eleanor and Sharon, 1993)

The results shows the proximate composition of the sample, The result shows that sample A, B and C has the following mean ± SD value of 33.46 **±** 0.07, 34.28 **±** 0.05, 36.48 **±** 0.005 for Protein, fat has 29.23 ± 0.04, 29.20 ± 0.01, 26.84 ± 0.07, Fibre has 4.16 ± 0.08, 5.85 **±** 0.01, 4.91 **±** 0.05, Ash has 5.81 **±** 0.01, 6,53 **±** 0.01, 6.04 **±** 0.02, Moisture has 5.92 **±** 0.05, 5.46 **±** 0.07, 4.16 **±** 0.01, Carbohydrate has 20.64 **±** 0.04, 18.77 **±** 0.01, 21.43 **±** 0.01, Kcal has 479.5 **±** 0.04, 475.0 **±** 0.01, 473.3 **±** 0.07. Respectively **(**Table 1), The result also revealed that sample A has the higher kcal but all in a close range.

GENERAL DISCUSSION

The fat content of the sample A,B and C in ratio 50:50, 70:30 and 80:20 has a higher value of fat than what Onoja, *et al*, (2014) earlier reported to be 17.35 % and also below what Born Horst, *et al.,* (2014) reported in her work to have 32.2 %.

Fibre content of the sample A, B and C in ratio 50:50, 70:30 and 80:20 has a higher value of fibre than what Onoja, *et a*l, 2014 earlier reported as 1.15 %.

The carbohydrate content of sample A, B and C in ratio 50:50, 70:30 and 80:20 has a lower carbohydrate value than Onoja, *et a*l, (2014), earlier reported as 23.75%.

CONCLUSION AND RECOMMENDATION

Asha seed is an oil seed crop with edible and odourless oil and with a good source of protein for man and livestock. Its utilization is however mainly for export and limited household used within region in which it is grown in the nation. The result shows that the formulated complementary foods are Nutrient dense with good proximate result. Food to food fortification thus appear to be vital in upgrading the Nutritional properties of the complementary food produced and could help solve the problem of protein energy malnutrition in the region that are devastated by this Epidemic. Further research should be carried out on the rheological properties and pasting properties of this product and government should encourage youth with loan for the production.

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