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Development of Complimentary Food from Soy Bean and Soy by –Products

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ABSTRACT

Shortage of Animal protein has led Researcher to quest for plant protein for children transition to Adult survival. Although total breastfeeding is more convenient and advocated for childhood growth from ages 1 to 6 months. The study aimed to examine the Complimentary foods that was developed from soy bean and soy by –product. The Plant based complimentary food was formulated as follows soydehulled 10 %(SD) , Whole soy10%(SW), soymilk10%(SM) and control dietary(CD) and basal (BA100) . The study considered Growth Response, the weight of the endocrine, the nitrogen retention of the experimental animal the nitrogen retention of the experimental animal The Outcome of the experimental Animals fed with (SD) , (SW), (BA), (SM) and control dietary(CD) basal (BA100%), shows weight gain by 52.47g ,23.99g, 25.57g,38.95g and basal diet loss weight by -0.38g respectively. The performance revealed that plant based complementary foods has potential to promote growth was compared favourable with control dietary but the basal diet (negative control) could not promote growth because it is deficient in amino acid such as tryptophan and lysine. In conclusions plant based complementary food is cheap, available and could replace animal based food that has been linked with some medical ailments such as, c, osteoporosis, high blood pressure a cholesterol and childhood obesity. Soy Plant protein based contain low calories, carbohydrate, and free fatty acid similar to fish protein which is important for people who are allergic to cow protein milk and lactose.

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Introduction

Soybean (*Glycine max* (L.)) is one of the most important oil crops of the world which also has tremendous importance as a food legume. Cow's milk protein allergy (CMPA), also known as cow's milk allergy (CMA), is one of the most common food allergies in babies, and usually appears before 1 year of age. Milk beverage is high in potassium, calcium and vitamin D, three essential nutrients that are under consumed by most Americans. It is also a good source of zinc, magnesium and B-complex vitamin. Commercial powder milk associated with commercial powder milk link with the danger commercial powder milk [1]. Lactose intolerance milk. Food allergies occur when the body's immune system (the body's own defense mechanism) responds abnormally to certain foods. Usually, the immune system helps the body to fight against harmful things like pathogens. For people with food allergies, the immune system incorrectly identifies certain food components as harmful and produces an inappropriate response. This leads to the unpleasant, and sometimes life-threatening, signs and symptoms associated with allergies.

More than 120 foods are known to cause food allergies. According to International Institute of Tropical Agriculture Soy bean is an important source of high inexpensive protein 40% and oil 20 % [2]. Soymilk contain protein and fibre and has used as substitute for a cow's milk for infant and young children. Animal study studies

s especially on Soymilk are good source of various vitamin and minerals, including molybdenum vitamin K1 (phyloquinone), folate vitaminB9, considered particularly important during pregnancy, The disadvantage of soy bean and by product is copper, manganese is deficient in soybean Soy bean is a good source of omega-3and 6 fatty acid similar to those found in fish oil and are cholesterol free and are excellent source of dietary source of dietary both soluble and insoluble fibre.

[3] It has been reported that Soy bean and Soy- product are also used as low-cost substitute texture vegetable protein used for over 50 years as a way of extending ground beef without reducing its nutritional value. Some Studies has revealed that taken soy bean and soy by –products could reduce Osteoporosis which is characterized by reduced bone density and an increased risk of fractures, especially in older women. Consumption of soy products may reduce the risk of osteoporosis in women who have undergone menopause.

Ethical Consideration

Permissions were sorted from Ethical committee of Obafemi Awolowo University, Ile-Ife, Nigeria, to use fifty Albino Rat for experimental analyze on soy bean and soy by –products.

Materials

Fifty white wister strain albino rats, metabolic cage, casein, The Plant based complimentary food/supplement dietary was as follows Soy dehulled (1) ,Whole Soy(2), Soymilk(3) casein(4)

and basal (Basal)5.

Methods

Fifty white wister strain albino rats was purchased from animal breeding enter Obafemi Awolowo University, Faculty of Health Science Ile-Ife, Nigeria. The weights of the experimental animals were ranged from 50.78g-50.95g. They were six weeks old. The experimental animals were randomly selected weighed and distributed into five groups of ten per group and were caged in a metabolic cage fitted with a feeding bottle and plate. They were fed on 10% casein for seven days to acclimatize them to the new environment. The experimental animals were weighed again reweighed on three decimal analytical mettler balances and distributed into six groups of ten per group. 10g of supplements dietary were supplied daily. The leftover of the dietary samples were carefully recorded and the weights were noted. Weight gain/loss of the experimental animals was taken every three days and was graphically sketched as in figure 1. At the end of the experiment, which was twenty-eight days, the experimental animals were anesthetized sacrificed. The organs collected from the animal were heart, kidney and liver were fixed immediately in 10% formyl saline for further experiment such as nitrogen retention [4-11].

Results and Discussions

Table 1: Composition of Soy Bean and Soy by –Products

Dietary	Protein	Fat	Moisture	Fibre	CHO	Dry Matter
SD	38.56	15	2.8	3.2	40.44	97.2
SW	40.72	18	2.5	4.4		97.5
SM	25.86	15.50	2.8	3.5		97.2
CD	18.64	0.80	2.5	3.2		96.8
BA	-	2.5	2.8	4.6		95.4

The protein contents in sample SD, SW, SM CD and BA ranged between – 40. 72, Fat was ranged from 0.80 to 18, Moisture was ranged from 2.5 to 2.8, fibre ranged from 3.2-4.6, CHO ranged from, and Dry Matter ranged from 95.4 to 97.2 respectively.

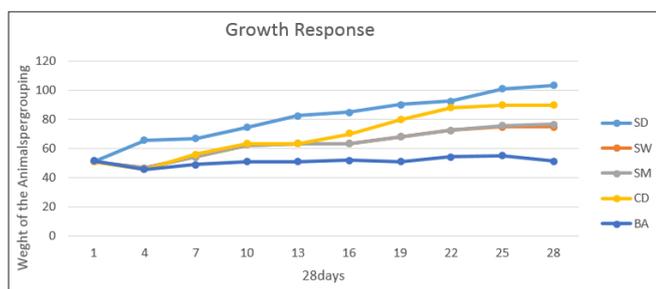


Figure 1: Growth Response of Animal Experiment for 28 days

Figure 1:Growth Response for SD soy dehulled was ranged from 50.76g to 103.23g SW soy whole was ranged between 50.99 to 74.90 SM soy milk was ranged from 50.99 to 76.56 Control Diet was ranged from 50.95to 89.90 while the list growth was found in Basal Diet 51.60-51.22. Basal is negative control could not promote growth because it is deficient in amino acid such as lack tryptophan and lysine. The best performance was achieved from soy dehulled (SD). Soy bean is a good source of omega-3and 6 fatty acid similar to those found in fish oil and are cholesterol free and are excellent source of dietary source of dietary both soluble and insoluble fibre. It has been reported that Soy bean and Soy- product are also used as low-cost substitute text [4-12].



Figure 2: Weight gained

Figure 2: Weight gained for SD, SW, SM, CD, and BA was 52.47g, 23.93g 25.91, 38.95 and -0.38 respectively [8].

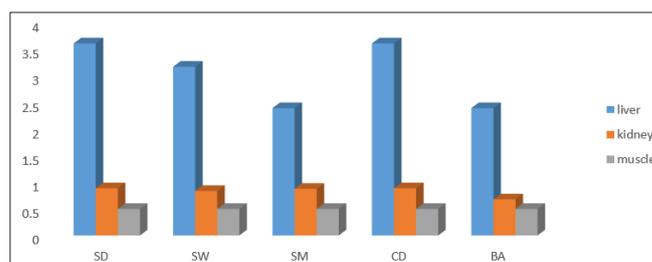


Figure 3: Showcase the Weight of The Internal Organ of the Experimental Animals

Figure 3: Showcase the Weight of the Internal Organ of the Experimental Animals. Mean ± SD values of three determinations with different superscript in a column are significantly different (P The weight of internal organ liver, kidney SD, SW SM CD and BA was 2.42 to 3.62, 0.69 to 0.89 and 0.5 muscle was selected from every sample dietary. The growth response also affect the endocrine of Basal because it is negative control could not promote growth because it is deficient in essential amino acid such as tryptophan and lysine. The best performance was achieved from soy dehulled (SD).may be some ant nutrient has been removed during processing , Soy bean is a good source of omega-3and 6 fatty acid similar to those found in fish oil and are cholesterol free and are excellent source of dietary source of dietary both soluble and insoluble fibre. It has been reported that Soy bean and Soy- product are also used as low-cost substitute text [3-13].

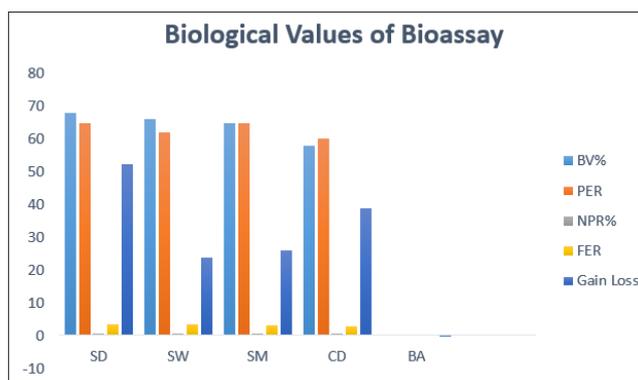


Figure 4: Presents the Nitrogen Retention of the Experimental Animal

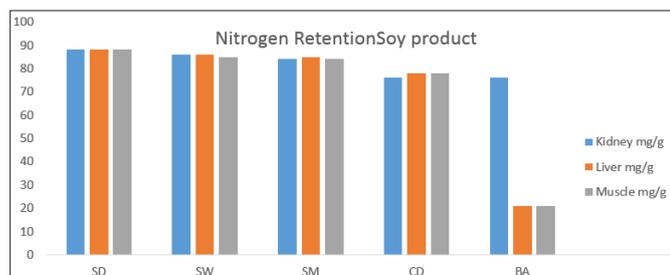


Figure 5: Represents the Nitrogen Retention of the Experimental Animal

Soy bean is a good source oil of omega-3 and 6 fatty acid similar to those found in fish oil, high protein and are cholesterol free and are excellent source of dietary of both soluble and insoluble fibre. It has been reported that Soy bean and Soy- product are also used as low-cost substitute. Soy protein has no cholesterol gluten and lactose free phytochemicals soy product contain sucrose such as sucrose as the basic disaccharide which breakdown into glucose and fructose.

Soy bean has been reported to be high in protein, good source of omega-3 and 6 fatty acid similar to those found in fish oil and are cholesterol free and are excellent source of dietary source of dietary both soluble and insoluble fibre. It has been reported that Soy bean and Soy- product are also used as low-cost substitute to many product. Soy protein has no cholesterol gluten and lactose free phytochemicals soy product contain sucrose such as sucrose as the basic disaccharide which breakdown into glucose and fructose [4-31].

Conclusion

Soy - Plant protein based is inexpensive, available contain low calories, carbohydrate, fat fatty acid is important for people who are allergic to cow protein and lactose. Soy protein has no cholesterol gluten and lactose free phytochemicals soy product contain sucrose such as sucrose as the basic disaccharide which breakdown into glucose and fructose. A product of lactose breakdown, soy based infant formula can safely replace breastmilk in children with galactosemia, soybean contain galactose like lactose free Soybean is heap, available and nontoxic soy bean and soy by –products could replace animal based complementary dietary food that has been linked with some medical ailments such as, morbidity and mortality cow’s milk allergy, osteoporosis, high blood pressure a cholesterol and child hood obesity. Soy Plant protein based is inexpensive, contain low calories, carbohydrate, and has free fatty acid similar to fish. Soy bean and soy by –products could be alternative food to children who are allergic to cow protein and lactose.

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References

1. Crittenden RG, Bennett LE (2005) Cow’s milk allergy: A complex disorder. *J Am Coll Nutr* 24: 582S-591S.
2. International Institute of Tropical Agriculture IITA (2007)

Research for Africa www.Iita.org/coms.

3. Heaney RP (2000) Calcium, dairy products and osteoporosis. *J Am Coll Nutr* 19: 83S-99.
4. Ibrinke SI, Fashakin JB, Badmus OA (2012) Nutritional Evaluation of Complementary Food Developed from Plant and Animal Protein Sources: *Emerald, Nutrition & Food Science* 42: 111-120.
5. Adeniyi MA, Fashakin JB, Ibrinke SI (2014) Determination of Mineral Contents, Proximate Composition and Functional Properties of Complementary Diets Prepared From Maize, Soybean and Pigeon Pea: *American Journal of Nutrition and Food Science*: 1: 53-56.
6. Ibrinke SI, Ige MM, Bejide RA (2016) Histopathological and In-Vivo Study Of Moringa Oleifera Seed: *Annals. Food Science and Technology* 17: 102-108.
7. Ibrinke SI, Akinola EA, Adepeju AB (2017) Comparative Study of Condiment Vegetable Basil Leaf (*Ocimum gratissimum*) and Bitter Leaf (*Vernonia Amygdalina*).” *American Journal of Food and Nutrition* 5: 95-98.
8. Adefisola Bola Adepeju and Samson Ishola Ibrinke (2019) Formulation and Nutritional Composition of Cereal Based Complementary Food”. *EC Agriculture* 5: 435-441.
9. Ibrinke SI (2020) Physico-Chemical, Nutritional Evaluation, Haematology of Water and Amaranth Vegetable Leaves. *J Nutr Health Sci* 7: 204.
10. Ibrinke SI (2021) Biotechnological Evaluation of Dietary Formulated from inoculation of Three Micro-Organisms. *Nutr Food Technol* 7: 110.16966
11. Ibrinke SI (2021) Nutritional Status and Cognitive Value of Egg White, Egg Yolk Whole Egg based Complementary Food.): 101. *J Nutr Health Sci* 8: 1-5.
12. Ewuola GO, Ibrinke SI, Fashakin JB (2015) Formulation and Nutritional Evaluation of Maize, Bambara Groundnut and Cowpea Seeds Blends Complementary Food: *American Journal of Food and Nutrition*, 3: 101-105.
13. Ibrinke SI, Adeniyi MA, Fashakin JB (2014) “Nutritional evaluation of complementary food formulated from fermented maize, pigeon pea and soybeans”, *Nutrition & Food Science* 44: 464-470.
14. Ibrinke SI, Adeleke RO, Otutu O, Ajele CA, Ige MM (2014) Nutritional Composition of Cereal filtrates based Beverages: *Emerald, Nutrition and Food Science*, UK 44: 111-118.
15. Ibrinke SI (2014) Formulation of Infant Weaning Foods from Vegetable Proteins and Cereal. *American Journal of Food Technology* 9: 104-110.
16. Ibrinke SI, Fashakin JB, Ige MM (2014) Nutritional Quality of Animal Polypeptide (Crayfish) Formulated Into Complementary Foods.” *American Journal of Food and Nutrition* 2: 39-42.
17. Ibrinke SI, Fashakin JB, Ige MM, Ikujenlola VA (2014) Formulation of Complementary Foods Developed from Plants Polypeptide (*Parkia Biglobosa*), Soy Bean and Maize: *American Journal of Nutrition and Food Science* 1: 72-77.
18. Ibrinke SI, Ige MM (2014) Growth Pattern and Nutritional Status of School Children Aged 6-14 Years of Selected Schools in Osun State, Southwest-Nigeria: *Annals. Food Science and Technology* 15: 387-391.
19. Oladeji BS, Akanbi CT, Ibrinke SI (2014) Physico-Chemical And Nutritional
20. Evaluation of Co-Processed Fermented Yellow Maize Ogi (An Infant Diet) and Carrot Blends: *Annals. Food Science and Technology*: 15: 82-91.
21. Ibrinke SI, Ige MM (2015) Nutritional Evaluation and Chemical Analysis of Two Commercial Infant Foods in

- South-Western, Nigeria: International Journal of Nutrition and Food Sciences 4: 590-593.
22. Ibrinke SI, Fawale O (2015) Chemical Analysis and Animal Bioassay of Hildegardia Barteri (Kariya Seed) Soy Bean and Maize: Annals. Food Science and Technology 16: 245-250.
 23. Ibrinke SI, Adepeju AB (2016) “Nutritional Assessment of Breakfast Foods Developed from Animal Polypeptide, Crayfish (Euastacus Spp) and Maize (Zea Mays).” American Journal of Food and Nutrition: 4: 131-134.
 24. Oladeji BS, Irinkoyenikan OA, Gbadamosi, SO, Ibrinke SI, Akanbi CT et al. (2016) Comparative analysis of physico-chemical properties and amino acids profile of three tropical maize hybrid cultivars in Nigeria: Emerald, Nutrition & Food Science: 46: 695-705.
 25. Ibrinke SI, Ige MM, Adepeju AB, Otutu O (2017) Haematological and In-Vivo Study of Moringa Oleifera Seed. MOJ Food Process Technol 4: 00109.
 26. Ibrinke SI, Alakija O (2018) Production of Soy Cheese from Vegetable Protein Using Different Coagulants. J Nutr Health Sci 5: 107.
 27. Ibrinke SI, Adepeju AB, Otutu O, Oyedele DS, Oyebola YO (2018) Nutritional
 28. Evaluation and Comparison Study of Seafoods, Fish and Crayfish Dietary MOJ Food Process Technol 6: 00109.
 29. Ibrinke SI, Adepeju AB, Otutu O, Oyedele DS, Oyebola YO, Et al. (2018) In vivo and haematological study of some selected vegetable condiments: MOJ Food Process Technol 6: 318-323.
 30. Ibrinke, Samson Ishola, Isaac Owotomo (2019) Haematology and Comparative Study of Fluted Pumpkin Leave Vegetable and Seed Nutrients (Telfairia occidentalis). Archives of Nutrition and Public Health 1.
 31. Ibrinke, Samson Ishola, Isaac Owotomo (2020) “Effect of Processing on the Nutritive Value of Fluted Pumpkin Vegetable Leaves (ugu) and Seed Nutrients (Telfairia Occidentalis) on the Health of Wister Rats”. Acta Scientific Nutritional Health 4: 127-131.

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