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Nutritional Assessment and Comparatives Studies of Sorghum Based Complimentary Diets

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ABSTRACT

Sorghum (grain) has form major source of energy for both human and animal kingdom including infant, children, and adult feeding regimen hence Sorghum classifies as purple, yellow, red and white according to the colour was taking into considerations. The aim of the research was to assess and compare the nutritional component of varieties of sorghums such as Sorghum purple, Sorghum white, Sorghum Red /orange and compare with Control, and The diets was formulated with protein isolate. Then it was fed to animals of five groups of ten animals each. The following was taking into consideration growth response, weight gained, the animal nitrogen retention and biological value. The result showed that Growth response, weights was gained, the animal nitrogen was retention and biological for all sorghum dietary was positive and compare favourably with control diet, sorghum based was appreciating progressively and positively but basal diet was depreciating downward. In conclusion All components of sorghum were potential functional food give source energy but white sorghums gave the highest nutritional value could promote growth has weight gain, however colour sorghum on the order hand contain vitamin A, and high in antioxidant.

Keywords: Sorghum Based Complimentary, Functional Food, Antioxidant, Human and Animal.

INTRODUCTIONS

Sorghum is a versatile crop that comes in various colour, each with its unique characteristics and uses. Here are some of the main types of sorghum [1-3].

Colour sorghum is a type of sorghum that has been bred to have a range of colours, including red, orange, yellow, white, and even purple! Here are some of the different types of colour sorghum:

Varieties of sorghum

Red Sorghum: This type has a deep red colour and is high in antioxidants, Orange Sorghum: This type has a vibrant orange colour and is often used as a natural food colouring, Yellow Sorghum: This type has a bright yellow colour and is often used in traditional African dishes, White Sorghum: This type has a white or cream-colored grain and is often used in brewing and as a food ingredient. Purple Sorghum: This type has a deep purple colour and

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is high in antioxidants and anthocyanin, Bronze Sorghum: This type has a reddish-brown colour and is often used as a decorative [1-3].

Industrial applications of sorghum

Sorghum grain is used in baking, cooking, and as a gluten-free alternative to wheat.

Sorghum is used as a nutritious feed for poultry, livestock, and aquaculture.

Ethanol Production: Sorghum is used as a biofuel feedstock for ethanol production.

Beer Brewing: Sorghum is used as a gluten-free alternative to barley in beer production.

Bioenergy: Sorghum is used for biomass energy production.

Cosmetics: Sorghum extract is used in skincare products due to its antioxidant and moisturizing properties [1-3].

Traditional Medicine: Sorghum has been used in traditional medicine for various ailments, including diabetes and inflammation.

Sorghum straw and stalks can be used as a nat.

Sorghum is a versatile crop with various uses, including:

Other industrial application values including, Sorghum straw and stalks can be used as a natural compost material, Sorghum roots help prevent soil erosion and improve soil health. Ornamental Purposes: Sorghum is used as an ornamental plant in landscaping and gardening.

Anti-nutrients in sorghum

Tannin Sorghum is high it is used for animal feed and nutritional supplements.

Waxy Sorghum: Used in Asian cuisine, particularly in China and Japan.

White Sorghum: A type of grain sorghum, used for food and animal feed [1-3].

Application of sorghum are many in food industries. Its adaptability and nutritional value make it a valuable crop for various industries and applications.

Ethical consideration

Permission was sorted from Ethical Committee to use Fifty Albino rats at Obafemi Awolowo Univesity, ile-Ife, Nigeria.

Materials

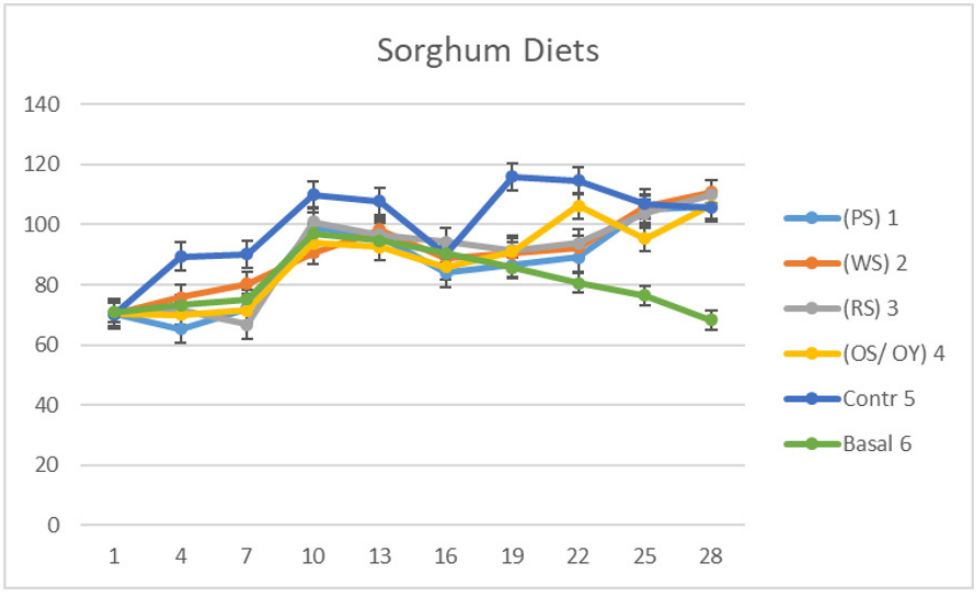
Sorghum purple, Sorghum white Sorghum Red /orange Control and Basal diet purchase from Teaching and Research Farm

Fifty Albino rats was purchase from Animal Breeding centre, Obafemi Awolowo Univesity, ile-Ife, Nigeria.

Methods

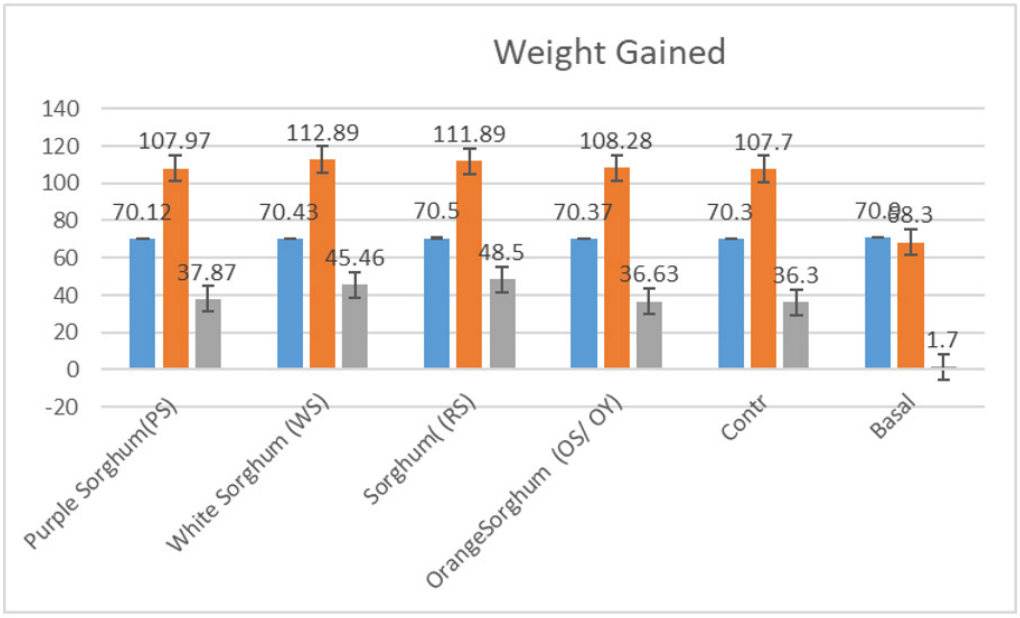
The method of Ibironke et al., [4-10] was adopted. Fifty Wister albino rats of both sexes were obtained from the Animal breeding centre, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria. The weights and ages of white albino rats were ranged from 70.12 - 70.90g and were ranged between 3-6 weeks old, respectively [4-10]. The experimental animals were randomly weighed selected and distributed into five groups of ten animals per group and was housed in a metabolic cage. They were fed on animal feeds finisher for seven days to a them adapt to the new environment and make them stable and familiar to the environment. The experimental animals were placed on the experimental diets 1-5 for a period of 4weeks). Water and food was administered ad libitum to the experimental animals daily. During the period of 28 days of the experiment, feed intake was recorded and the weights of the experimental animals were taken every three days. Seven days towards the end of the experiment, the faeces and urine of the experimental animals in the different groups were collected separately. Urine was stored inside a bottle per group containing 6N HCl in order to preserve it, prior analysis, and the faeces were dried in an oven at 60 o C for 12 hours, cooled, weighed and stored inside sealed polythene, per group. At the end of the 28 days, the animals were weighed, anaesthetized and sacrificed. Tissue samples from liver, kidney` and plantaris muscles were removed, Nitrogen in the faeces and urine were determined by the micro Kjeldahl method . The organs collected from the animal including heart, lungs, kidney and liver were fixed immediately in 10% formyl saline for further experiment such as Nitrogen retention [10-15].

RESULTS AND DISCUSSIONS



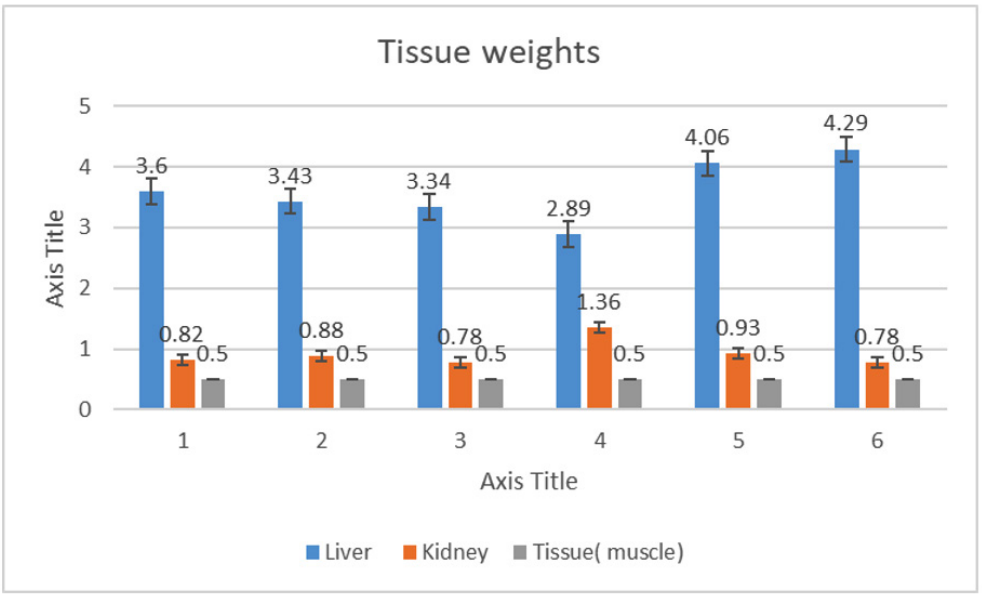
Line Chart 1. Growth Response.

Line chart I indicates the growth response of experimental animal fed with varieties of sorghum white colour has the growth followed by Sorghum purple, Sorghum Red orange and compare favourably with Control, [15-20]



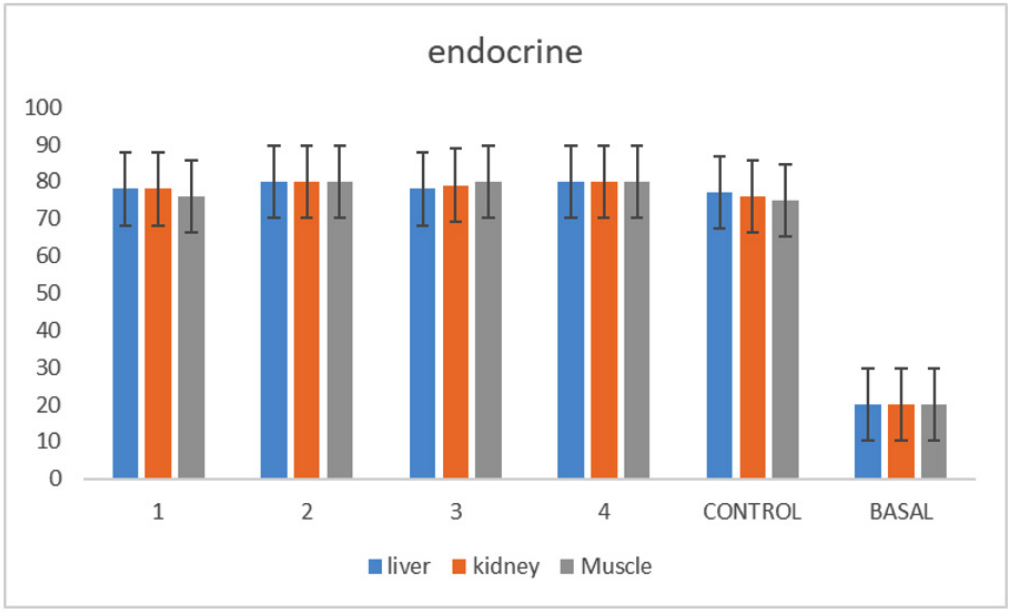
Bar Chart 2. Weight Gained.

Bar Chart 2 shows the weight gained experimental Animal fed with varieties of sorghum white colour has the highest gained weight followed by Sorghum purple, Sorghum Red /orange and compare with Control but basal could not sustain growth because it is limiting in essential amino acid [15-20].



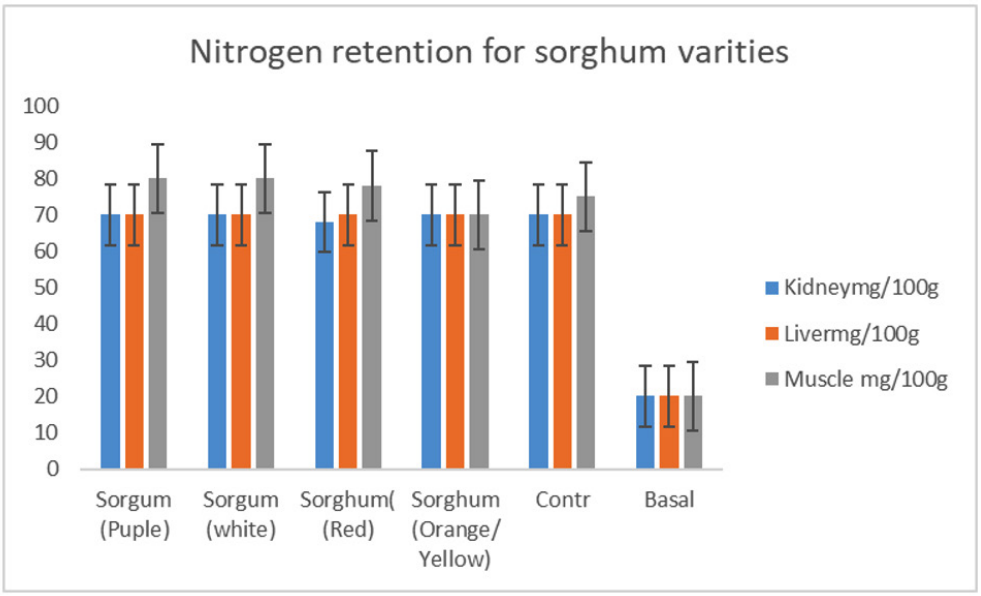
Bar Chart 3. Tissue weights.

Bar chart 3 shows the weight of the tissue of experimental animal fed with varieties of sorghum white colour has the growth followed by Sorghum purple, Sorghum Red /orange and compare with Control but basal could not sustain growth because it is limiting in essential some amino [20-26].



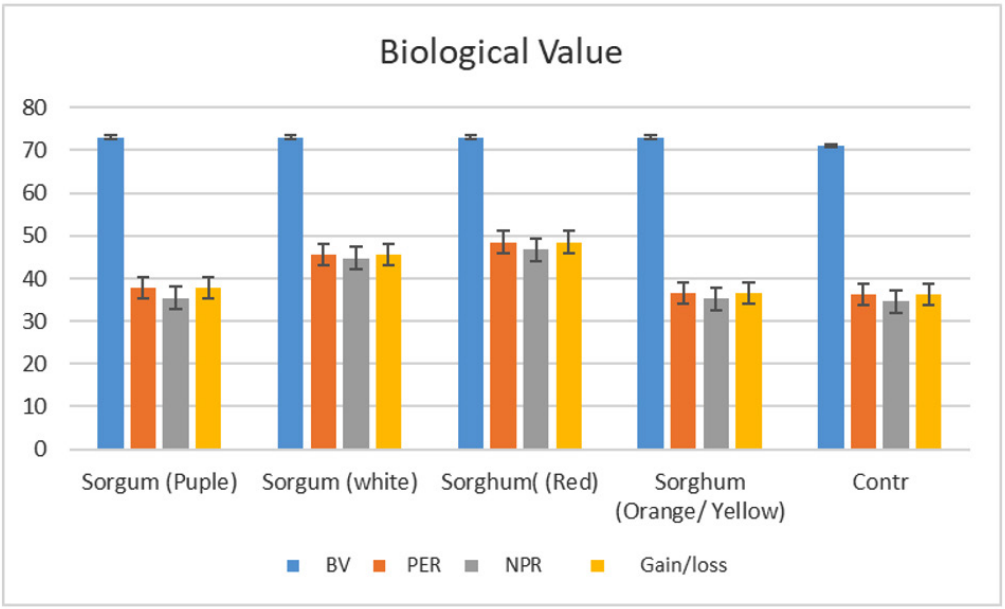
Bar Chart 4. Endocrine.

Bar chart 4 reflects the growth of the endocrine system of experimental animal fed with varieties of sorghum white colour has the growth followed by Sorghum purple, Sorghum Red /orange and compare with Control the growth of endocrine shows that sorghum of various type is a source of energy and indicate the wellbeing of human and animals but basal could not sustain growth because it is limiting in essential amino hence the endocrine is emaciating [21-26].



Bar Chart 5. Nitrogen Retention.

Bar chart 5 gave the detail of the nitrogen retention of experimental animal fed with varieties of sorghum white colour has the growth followed by Sorghum purple, Sorghum Red /orange and compare with Control It show that sorghum varies reported to be source of energy at the same time has nitrogen that could sustained both human and animals but basal could not sustain growth because it is limiting in essential amino hence lack nitrogen retention [21-26]



Bar Chart 6. Biological values.

Bar chart 6 explains the in-depth of the biological value experimental animal fed with varieties of sorghum white colour has the growth followed by Sorghum purple, Sorghum Red /orange and compare with Control white sorghum gave the highest nutritional value, then follow by red sorghums all gave nutritional values and source of energy, but basal could not sustain growth because it is limiting in essential amino hence lack nitrogen retention and biological value however colour sorghum on the order hand contain higher vitamin A than white sorghum, and high in antioxidant [21-26].

CONCLUSION

All component of sorghum was potential functional food give source energy white sorghum gave the highest nutritional value, then follow by red sorghums the rest nutritional value. All sorghum could promote growth gain weight, colour sorghum has anti-oxidant and vitamin, but basal could not sustain growth because it is limiting in essential amino hence lack nitrogen retention and biological value.

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CONFLICT OF INTEREST

The author declares that there is no Conflict of interest.

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