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USAGE OF FENUGREEK AS APPETITE TO INCREASE THE WEIGHTS OF CHILDREN AGED (3-5)

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ABSTRACT
The study aimed at showing the possibility of using the circuit as an appetizing substance capable of weight gain for the research sample, which included 5 children aged 3-5 years with a few weights. The study increased their weight significantly during the period of research which lasted 3 months with the highest rate of increase 14.84 kg grams difference (P <0.05) due to the nutritional value contained in the fenugreek added to the mixture of honey, nuts and almonds, which increased the value of protein to 13.74 g with significant difference (P <0.05). The value of iron also increased by a significant difference, In terms of humidity and fat, there was a slight decrease the amount of the fenugreek added and also a slight increase in elemental lead and copper. In terms of sensory evaluation, treatment A2 was superior to most of the studied sensory characteristics, so it was selected for the study sample.

KEYWORDS: appetizing substance**,** fenugreek, children, age.

INTRODUCTION

There are many herbs and natural plants that are used in many treatments and have many benefits. One of these herbs is the ring[2,9], a common herbaceous plant characterized by nasty odor. It follows the leguminosae, called Fenugree [5]. Arabs knew it from ancient times, they said about; (if people knew what the fenugreek is, they would weight and buy it with gold) [6]. It is rich in a range of nutritious ingredients such as proteins, fats, carbohydrates and vitamins [3,11,28]. It has many benefits, such as an aperitif, weight gain, milk manager, treatment of anemia, arthritis, intestinal disorder such as constipation, Expectorant, cough treatment and skin softness [1,21,10].The treatment of diabetes and cholesterol reduction is confirmed by[30,18] using fenugreek as a reduced substance for blood sugar by stimulating the secretion of insulin from B cells which led to low sugar. Study [4] showed the possibility of using the fenugreek as a material to help reduce the size of polycystic ovaries in a sample of women suffering from PCOS. The result was that eating the seeds of the fenugreek at a daily rate of 500 mg worked to reduce the size of the bag. The fenugreek was also used to inhibit the growth or prevention of malignant tumors, as well as to stimulate and activate female hormones, this is confirmed by both [8,16]. In a study carried out by [29], it has been confirmed that the daily use of fenugreek in our food helps to increase milk through the use of the seeds of the fenugreek on a daily basis. The study of each of [17,18,12] proved the effectiveness of the seeds of the fenugreek as a natural source as antioxidants and antimicrobial, that comes because it does contain vitamin C , so it fenugreek can be used in the manufacture of food, especially for packaging purposes. Honey is a natural product made from plant nectar by honey bees containing water and sugars namely glucose and fructose in equal proportions and sucrose as well. Honey acid and p^H up to 3.9 flavor and aroma derived from plant pigments [27] known for its many benefits and medical uses and to heal many diseases and problems because of its important components [25]. One of the foods that is small in its size, however huge in its usefulness is, almond and walnuts due to their healthy fat content, which supply the body with the necessary energy as well as protein and minerals [22,15], walnut is known in its richness in omega-3 and vitamin A-B12. [13,26], while almond is a good source of monounsaturated fats that reduce the proportion of harmful cholesterol, antioxidants, vitamins, iron and minerals, almond is no less important than walnut [24,20,14].

MATERIALS & METHODS

Dry fenugreek seeds were purchased from the local market in addition to walnuts and almonds. The ingredients were homely grinded by a Philips electric grinder, into a fine powder, each component was separately grinded, natural honey was purchased.
Preparation of the mixture as given in Table-1.

TABLE 1: Materials used in the mixture

N	Materials	Quantity/g
1	Honey	50
2	Almont	25
3	Walnuts	25

The mixture was prepared by mixing the honey with the almond and walnuts, and according to the measurements mentioned in table (1), it is considered the control equation and then the fenugreek was added to the mixture according to table (2)

TABLE 2: Added percentages of the mixture

Code	Fenugreek/g	Honey/g	Almont/g	Walnuts/g
A	-	50	25	25
A1	3	49	24	24
A2	6	48	23	23
A3	9	47	22	22
A4	12	46	21	21
A5	15	45	20	20

Chemical Composition

The approximate chemical composition was estimated using the standard methods mentioned in (A.O.A.C) as shown below:

Moisture Estimating

The moisture was estimated by placing 2 - 3g of the sample in a jar of a known weight in an electric oven at a temperature of 105°C until the weight was confirmed, then the jar was cooled and weighed.

Ash Estimating

Ash was estimated by burning the sample in the Muffle Furnace at a temperature of 525 m until color changed to whitish gray.

Determination of protein

Protein determinate using Caldal method, as the ratio of total nitrogen was estimated and multiplied by factor 6.25 to extract the percentage of the protein.

Estimate of fat

The fat ratio was estimated using suxalite device for extraction using oil ether to extract fat.

Determination of mineral elements

Iron, lead, and copper were estimated using the Atomic Absorption Spectrophotometer device (Perkin-Elemer VSA 500), according to method mentioned in [19]

Sensory assessment

Sensitive evaluation of the mix was carried out by 10 specialists in the Department of Home Economics in accordance with approved evaluation form of the Food and Nutrition Department of the University of Kansas (USA 1975) (7) using the balance Hedomic scale From 1 - 7 degrees. 7 = excellent, 6 = very good, 5 = good, 4 = mid 3=acceptable,2=bad, 1=very bad by sensory characteristics (color, appearance, odor, texture, thickness).

After completion of the sensory evaluation, the Coefficient A2 was selected for use by the research sample consisting of five children between the ages of 3-5 years where the mixture was given to children three times a day and before eating the basic meal by a quarter to half an hour for a period of three consecutive months, children's weights have been taken before starting the experiment and during the use of the mixture once a month.

Statistical Analysis

Statistical Analysis System 2012 - SAS was used in data analysis[23] to study the effect of different Coefficients in the studied traits according to the complete randomized design (CRD). The differences between the averages were compared with the least significant difference (LSD).

RESULTS & DISCUSSION

Table (3) shows the chemical analysis of the processed mixture. It is clear that the percentage of the chemical components has increased morally ($P < 0.05$) by Increasing the percentage of additives. It has been recognized that protein content is morally higher than the control Coefficient, the highest increase in A5 Coefficient was observed, with 15g (13.74) of fenugreek being added in relation to control Coefficient A (10.64) this gives a positive indication to increase the nutritional value of the mixture, as for fat and moisture, a slight decrease was immorally recognized as it reached (19.03 and 9.00) respectively in the last Coefficient A5, ashes slightly and immorally increased in compare to control Coefficient. The increase in protein and ash was due to the increasing in fenugreek content for these components, which increased their amounts in the mixing.

TABLE 3: Effect of the studied treatments in the chemical composition of the mixture

Treatment	Protein (%)	Fat %	Moisture %	Ash %	carbohydrate
A	10.64±0.63	23.23±0.94	9.74±0.57	1.28±0.04	55.11 ±2.47
A1	11.05±0.72	21.69±0.79	9.64±0.61	1.30±0.07	32. 56±2.09
A2	12.49±0.69	21.65±0.84	9.56±0.43	1.37±0.03	54.93 ±2.16
A3	13.00±0.84	20.56±0.77	9.48±0.55	1.41±0.07	55.45 ±2.42
A4	13.35±0.71	20.35±0.66	9.40±0.64	1.46±0.05	55.44 ±2.73
A5	13.74±0.67	19.03±0.92	9.00±0.39	1.52±0.06	56.71 ±2.37
LSD	* 1.66	* 2.78	* 0.619	* 0.277	4.882NS
(*P<0.05)					

Table (4) shows the content of the mixture prepared from metal elements, which included iron, copper and lead. The results showed that there were statistical moral differences (P <0.05) in the content of the mineral elements by the increasing the addition of the fenugreek compared to the control coefficient, where the highest percentage of elements of coefficient A5, lead content reached to (1.50), with a slight increase in A coefficient which was (1.08) Copper was increased by a clear moral difference of (7.96) in coefficient A to (9.34) in coefficient A5. The moral cleared increase was in the iron component, this increase comes from (14.13) in coefficient (A) to (25.72) in coefficient A5. This is a good indicator indicating the nutritional value of the mixture to provide for this very important element for the growth and health of the children in this important stage.

TABLE 4: Effect of the studied treatments on the content of the mineral elements of the mixture

Treatment	Copper (ppm)	Lead (ppm)	Iron (ppm)
A	1.08±0.06	7.96±0.36	14.13±0.63
A1	1.16±0.09	8.19±0.42	16.45±0.72
A2	1.20±0.08	8.58±0.47	17.58±0.85
A3	1.25±0.08	8.68±0.39	21.12±0.94
A4	1.40±0.11	9.08±0.52	23.82±1.06
A5	1.50±0.09	9.34±0.47	25.72±1.35
LSD	* 0.339	* 1.074	* 3.647

2- The effect of adding the fenugreek on the sensory characteristics of the mixture of honey, almonds and walnuts, table (5) shows the results of the evaluation of the sensory characteristics of the mix models. It is noted that the evaluation was retreated from the first coefficient to the fifth coefficient, the higher the percentage of the fenugreek in the mix, the less of the acceptance of the mixture by the evaluation sample because of the bitter taste and the unwanted smell of in the fenugreek. Where in A5 coefficient it reached the lowest value in color, odor and taste (1.25, 1.00, 1.00), respectively. The coefficient A2 is the highest in terms of appearance, smell, textures, thickness and taste in addition of 6 g fenugreek, taste reach (6.00). Since this mixture was accepted by the testers, it was selected for use by the children in the research sample to be used as an aperitif and to control the children's weights during the three-month research period.

TABLE 5: effect of the studied treatments on the sensory characteristics of the mixture

Treatment	Taste	Tissue	Texture	Oder	colour	Appearance	Total
A	6.00±0.26	6.40±0.30	6.50±0.35	5.90±0.10	6.15±0.15	5.92±0.35	35.12±1.10
A1	5.50±0.42	6.00±0.26	5.50±0.32	5.50±0.42	5.25±0.16	5.75±0.31	33.25±1.08
A2	6.00±0.26	6.25±0.31	6.25±0.16	6.00±0.37	5.75±0.31	6.25±0.16	36.50±0.86
A3	3.50±0.32	3.25±0.49	3.50±0.42	2.75±0.31	3.00±0.37	2.75±0.41	18.75±1.34
A4	2.50±0.19	2.00±0.26	2.50±0.32	1.50±0.18	1.25±0.16	1.75±0.16	11.50±0.86
A5	1.25±0.16	1.25±0.16	1.50±0.32	1.00±0.00	1.00±0.00	1.25±0.16	6.50±0.19
LSD	*0.86	*1.39	*1.07	*0.92	*1.17	*1.09	*4.27
*(P<0.05)	±Standard error						

The effect of mixing on the weights of children

In Table 6 we observe the clear and significant change in the children's weights. We note that the lowest weight was before the mixture which was in the fourth sample weight (11) kg until reach (14) kg after the use of the mixture, then the third sample comes, who was weight (13.200) kg reach to(15,500) kg, Followed by the first sample and then the second and first samples.

TABLE 6: Baby weights before and after use of the mixture

The sample	Before use/kg	Month 1/kg	Month 2/kg	Month 3/kg
1	12.400	12.900	13.500	14.700
2	13.800	14	14.800	15
3	13.200	13.800	14.500	15.500
4	11	11.750	12.500	14
5	12.100	12.500	13.600	15

TABLE 7: Rates of increase in children's weights before and after the use of the mixture

time	Standard ±weight kg
Before the transaction	0.42 ± 12.50
First month	0.62 ± 12.99
Second month	0.47 ± 13.78
Third month	0.52 ± 14.84
LSD	* 1.046
P<0.05	

Table (7) shows the rate of change of children's weights during the three months in which the mixture was used. Note that there are significant differences (P <0.05). With a significant increase in usage up to the third month, the average weight before the equation was (12.50) kg, up to (14.84) kg in the third month.

This is an clear evidence about the effect of the fenugree used in the mixture, which helped to open the appetite of children aged (3-5) years, which led to increase their weight to the ability to open the appetite for its protein-rich ingredients and iron, which helps to grow in addition to the benefit of honey Walnuts and almonds.

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