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Evaluation of local food product on the growth rate of baby parrots

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Abstract

The aim of present study is to manufacture local food for baby parrots and study its effect on the growth rate in birds compared to imported food. The study was conducted on 30 Parrots age 7 days were divided as follows (10 parrots love birds, 10 parrots cocktail, 10 Alexandrine parrots), where the nutritional ratios were estimated for both local and imported food, and the results showed that it within the limits allowed by the **(NRC, 1994)**. The results also showed that local and imported food is free of fungal toxins. The percentage of digestible nitrogen retention (DNR) in the body of the bird was estimated, the results showed an increase in the digestion rate of the digested protein in both birds fed to local and imported food, as well as the fat absorbed by the body of the bird, increasing the growth rate and weight of birds. The results of this study indicate that local food is comparable to imported food unless it is superior to it. Therefore, we recommend that the local product be promoted and used instead of the imported one.

Keywords: *Baby parrots, digestible nitrogen retention, mycotoxin, love birds, cocktail bird, Alexandrine parrot bird, nutrition.*

Introduction

Many breeders of parrot's birds in Egypt are imported many kinds of baby parrots food as they not interested in manufacturing local food containing all the balanced nutrient. Therefore, we will study the manufacture of local food for the baby parrots and compare it with imported food and study weight, digestible nitrogen retention (DNR) and fat. When using hand feeding formula, it is necessary to take into account number of things, baby parrots should be left with the parent birds as long as possible if one wishes to maximize immunity from the parents. Also, intestinal flora is passed from parent to young with regurgitated.

When isolating baby birds from the nest for hand feeding, safety of the young must be considered. Most psittacine birds can be tamed if isolated around the time of natural weaning and hand fed for a few days to a couple of weeks **(Bucher, 1983).** Hand-feeding baby parrots is a vital part of any successful aviculture operation. Babies from artificially incubated eggs, those isolated from neglectful parents must be hand-fed for 3 to 5 months. **(Mark Hagen, 1992).** The goal of any exotic aviculture venture is to raise healthy babies with minimum losses. Thus achieving the fastest growth rates possible. Weights taken each morning as babies are usually allowed to empty over night. The time between feedings should slowly lengthen as the baby gets older but any sudden slow down in digestion is an indication of illness **(Stoddard, 1988**).

Animals, unlike humans, make nice experimental subjects and have been used in many attempts to define safe levels of mycotoxins. In a well-explored experimental model, the

growth of young broiler chickens is inhibited by 2.5 ppm dietary aflatoxin but not by 1.25 ppm **(Smithand Hamilton, 1970).**

Aim of The present work

The aim of the present work is to study the production of locally produced food for baby parrots and compare them with imported food known as the ratios, and also study the rate of growth in birds that fed on local and imported food until weaning phase, finally, we attempt to replace the local product and preference for the imported product.

Materials and Methods

Birds

Thirty parrots were used during the experiment, three different species of birds are used (love bird (10 birds), cocktail bird (10 birds) and alexandrine parrot birds(10 birds) .The birds were taken from the parents at the age of 7 days, all babies were clinically Healthy **(Bucher, 1983).**

Food

local food formula for baby parrots having vegetable protein extract, vegetable product, cereals, oils and fats, yeast, amino acids, minerals, sugar, digestive enzymes vitamins, natural antioxidant, and fruits according to **(NRC, 1994)**. Nutribird A21was compared with local food used as imported food .The seeds and fruits grains were dried at 65°C and ground in mill with a 1mm sieve **(Carciofi *et al.*, 2003** and **Sales *et al.*, 2004)**, the local formula prepared and collected by department of biochemistry, toxicology and nutritional deficiency, Animal health research institute, Cairo, Egypt.

Place of breeding birds

Baby parrots at the age of 7 days are kept in the plastic nursery until feathering and then the birds are transferred to the cages allocated for the breeding of baby parrots until weaning and each type according to size. Love birds were lodged individually in cages measuring 10 x 20 x 5 cm, cocktail birds were lodged individually in cages measuring 20 x 30 x10 cm and alexandrine parrot bird were lodged individually in cages measuring 30 x 40 x 30 cm. All of the cages had a grid at the bottom allowing faces and refused food to be deposited in a collecting tray, **(Carciofi *et al.*, 2003).**

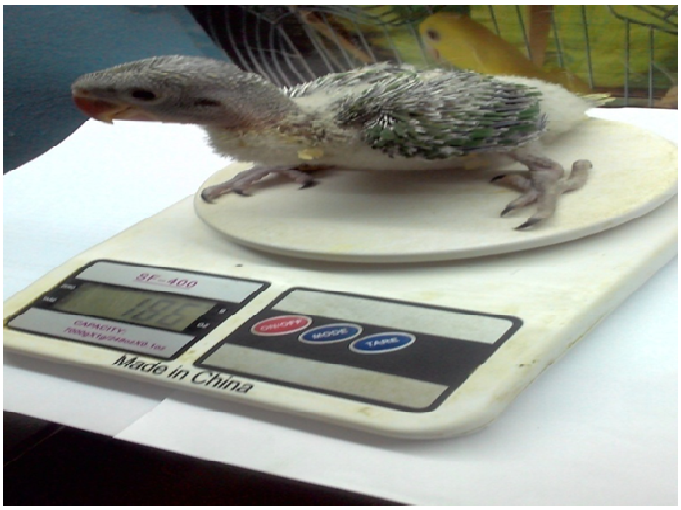
Feeding birds

The ten birds of three different species are divided into two groups each group having five baby parrots, one group feeding imported food and the other group feeding local food. this food prepared by using boiling water, then let warm to 40^0c, If the temperature of the food is greater than 41°C (105°F) it may scald the crop and cause necrosis **(Giddings, 1986)**, on the other hand high temperature affected on vitamins **(Abubakar and Simon, 2015)**. Also the enzymes affected by high temperature and pressure, enzyme action decreases above 40°C because the enzymes are denaturing more quickly **(Salwanee *et al.*, 2013)**. The food-water ratio changes with the age of the baby birds and must be carefully adapted. each love bird were fed 6 g / every day by food for a period of three consecutive weeks until weaning was completed, each cocktail bird were fed 8 g / every day by food for a period of three consecutive weeks, until weaning was completed, each Alexandrine parrot bird were fed at 12 g / every day by food for a period of six consecutive weeks. This different doses of different species return to different size between them **(Jeannine Miesle, 2010),** using syringe tip (**figure 1)** slightly into left side of beak with one hand. Pressure should be placed on the Beak's commissures with the fingers of the other hand and palm of hand held behind the head of chick, preventing the syringe to injure the mouth when chick will react with a feeding response. When bird gives feeding response (head pumping), start feeding and aim towards the back right side of the mouth. Close monitoring of chick response and respiration is essential to prevent aspiration. Fill crop without excess stretching. A daily weight monitoring and amount fed chart was kept for health growth parameters and future reference. Allow crop to completely empty between feeding

(**figure 2)**.
Birds that are being hand fed were weighed every morning and the weight was recorded. Failure to gain weight could be a signal of severe problems. Determination of weight of each bird was carried out by a sensitive balance **(Roudybushand Grau, 1986).** (**figure 3)**.

(**Figure 1)**

(Figure 2)



(**Figure 3)**

Samples collocation
face's collection was carried out every week up to three weeks, these collections were performed in the morning, after removing remaining food portions, feathers and adhered coetaneous scales. Then the material was stored in glass containers and stored frozen at −15ºC, Feces was ground and homogenized**,** moisture content was determined and converted to dry mater (DM), according to **(Carciofi *et al.*, 2003).**

Laboratory analysis
Protein, fat, carbohydrate, ash, fiber, vitamin and mineral salts and net energy **(EG),** of feeding and faces were analyzed according to the Association of the Official methods of Analysis Chemists **(AOAC, 2015)** and subsequently the Digestible nitrogen retention absorption **(DNR)**, fat absorption percent **(FA%)** and weight **(WT)** were calculated according to the method described by **(Reddy, 2001)** and **(Noha *et al.*, 2016).**

Quantitive determination of mycotoxins by scanning spectrophotometer were carried out to identify and quantify myctoxin in local and imported feed according to **(AOAC, 2008).**

Statistics:
The Statistical Package for the Social Sciences (SPSS/PC) computer program was used for statistical analysis of the results. Data were analyzed using one way analysis of variance (ANOVA) followed by Post Hoc to determine significant differences between means. The data were expressed as mean ± standard error. Differences were considered significant at $P \leq 0.05$, according to **(Duncan, 1957).**

Results and Discussion
Plant seeds in local food as presented in **(table 1)** are important for baby parrots **(Collar *et al.*, 1997)**. Soybean meal solvent extract contain 40% of crude protein and Soybean seed have about 20% of fat, the protein of soybean contains the considerable quantity of lysine, on the other hand the soybean oil can be extracted and used **(Ensminger *et al.*, 1990; NRC, 1994; Poultry Feeding Standards, 2005).** Soybean meal as the commonly used source of dietary protein in poultry feed formulations around the world. Pisum sativum seed is widely available in many parts of the world, that play an important role as protein sources in birds **(Catootjie, 2009)**. Proteins are composed of nitrogen-containing molecules and amino acids. Since feathers are formed from protein, they comprise approximately 20% of the total body protein requirements in Psittacines **(Taylor *et al.*, 1994).**

On the other hand, yellow corn and wheat grain include high levels of carbohydrates (**Carmencita and Nelia, 2006**).

Carbohydrates are a quick source of energy for birds since they are readily converted into fats in the liver, carbohydrates are used to produce energy in the form of adenosine triphosphate (ATP) from glycolysis and the tricarboxylic acid (TCA) cycle, and produce heat from the oxidation of glucose to CO_2 and H_2O **(Grajal, 1991).**

Peanuts contain all the 20 amino acids in variable proportions and the biggest source of the protein called “arginine” **(USDA, 2014).** Peanut fat profile contains about 50% monounsaturated fatty acids (MUFAs), 33% Para formaldehyde (PFAs) and 14% saturated fatty acids which is a heart friendly combination of fatty acids (**Feldman, 1999).**

Peanuts are also a good source of dietary fiber and provide a wide range of essential nutrients, including several B group vitamins, vitamin E, minerals such as iron, zinc, potassium and magnesium, antioxidant minerals (selenium, manganese and copper), plus other antioxidant compounds (such as flavonoids and resveratrol) **(Geulein, 2010).**

The palm (phoenix sylvestris) as an antioxidant good inhibitor activity against bacterial food (**Amira *et al.*, 2013)** so, palm is added to local

food because a lot of birds feed on it in nature because of its vital importance to feathers and other healthy processes and this is what said by **(Aainaa *et al.*, 2015**). Several varieties of sunflower oil seeds have been developed by standard plant breeding methods, mainly to vary the amount of oleic acid and linoleic acid which respectively, are the predominant monounsaturated and polyunsaturated fats in sunflower oil, Sunflower oil is high in the essential vitamin E and low in saturated fat,this is important in the growth and brightness of feathers in birds and this is consistent with **(Skorić *et al.*, 2008).**

Yeast is added to most of the baby bird foods because of its importance in helping and facilitating the process of digestion, as it contains many useful amino acids and this is confirmed by (**Nora *et al.*, 2013).** The digestive enzymes play an important role in feeding baby parrots are buggies as they lack many of them in the early stages of life according to **(NRC, 1994)**. Vitamins are organic compounds that are necessary for metabolic processes of the bird's body and this is consistent with **(Maynard and Loosli, 1969)** and **(Jimenez, 2008).** Also, Minerals are for building bones and required for glucose and protein metabolism and this is confirmed by **(Jimenez, 2008 and Nora *et al.*, 2013).**

The use of curcuma in food additives for birds has an important role in resisting some diseases and climatic changes that may be encountered by the baby parrots praise the process of food until weaning and this is what said by **(Akbarian *et al.*, 2014).**

After the process of grinding seeds with additives of the amino acids, vitamins and mineral salts are mixed well, the results showed the following; the percentage of crude protein in local food is (24%) while in imported food is (21%) as shown in **table (3).** This results are consistent with (**Roudybush and Grau, 1985; Roudybush and Grau, 1986).** The percentage of crude fat in local and imported food is (6%) and (8%) as shown in **table (1)** and **table (3)** respectively. This result is in the permissible limit according to **(NRC, 1994)**, if the percentage more than 10%, rancidity will be occurred. The percentage of ash, fiber, moisture and carbohydrates in local food is (7%), (4%), (9%) and (50%) respectively as shown in **table (1)**. On the other hand, In imported food, the percentage of ash, fiber, moisture and carbohydrates is (6.1%), (3.4%), (7%) and (54.5%), respectively as shown in **table (3)**.This result is in the permissible limit according to **(NRC, 1994)**.

Results of vitamins and mineral salts in local food **table (2)** and imported food **table (3)** are in the permissible limit for bird's chicks according to **(NRC, 1994; O'Toole and Raisbeck, 1997; Koutsos and Klasing, 2002).** The results also showed that local and imported food (NutriBird A 21) are free of fungal toxins**,** (aflatoxin and Ochratoxin), this results supported by **(Smith and Hamilton, 1970).**

Data concerning digestible nitrogen retention (DNR) in love birds showed no significant change when compared local food with the imported one via three weeks, **table (4),**when compared imported food at 2nd and 3rd week with 1st week, slightly increase was observed, Local food showed the same result .**figure (4)**, this is supported by **(Sales *et al.*, 2004).**

The percentage of fat absorption **(**FA) in love birds **table (5)** shows significant decrease ($p < 0.05$) in local food when compared with imported food through different times, when compared imported food at 2nd and 3rd week with 1st week, slightly increase was observed, local food show the same result **figure (5)** this results has been discussed by **(Carciofi *et al.*, 2003).**

Table (6) represent weight of love birds**,** the results obtained shows no significant difference between local and imported food through three weeks, on the other hand, when compared imported food at 2nd and 3rd week with

1st week,, significant increase was observed ($p < 0.05$), local food show the same result **figure (6)**, this results is in agreement with **(Carciofi *et al*., 2003 and Sales *et al.,* 2004)**.

Table (7) explain the results obtained of digestible nitrogen retention (DNR) in cocktail birds**,** there is no significant change when compared local food with imported food through three weeks, when compared imported food with different times, significant increase was observed ($p < 0.05$) at 3rd week and the local food shows significant increase ($p < 0.05$) at 2nd week and 3rd week when compared with the 1st week **figure (7)**this is in agreement with **(Roudybush and Grau, 1985; Roudybush and Grau, 1986).**

Table (8) represents the percentage of fat absorption (FA) of cocktail birds, results obtained shows significant decrease ($p < 0.05$) of local food when compared with imported food through three weeks, this is due to the difference in the proportion of fat in imported food (10%) is higher than the percentage of local food (6%), this results has been discussed by (**Hagen, 1999; Sales and Janssens, 2003).**

When compared imported food and local food with different times, significant increase was observed ($p < 0.05$) at 3rd week when compared withthe1st week **figure (8)** this results is in agreement with (**Hagen, 1999)** and **(Carciofi *et al.,* 2003).**

Table (9) represents weights of cocktail birds, the results obtained showed no significant difference when compared local food with imported food through three weeks, but remarked significant increase ($p < 0.05$) was observed at 2nd week and 3rd week when compared imported food and local food with1st week **figure (9)** the increase of digestible nitrogen retention (DRN) and fat absorption **(**FA) lead to an increase in the growth rate and weight of the parrots birds this is supported by (**Roudybush and Grau, 1986)** and **(Noha *et al*., 2016).**

Table (10) represent the data obtained of digestible nitrogen retention (DNR) of Alexandrine parrot birds**,** results showed symmetrical and approximation between local and imported food through six weeks, on the other hand, when compared imported food and local food with different times of the same food, significant Increase was observed ($p < 0.05$) at 6th by 1st week **figure (10), (Sales and Janssens, 2003; P F S, 2005).**

Table (11) represent the percentage of fat absorption (FA) of Alexandrine parrot birds**,** results obtained shows significant decrease ($p < 0.05$) of local food when compared with imported food through six weeks, this is due to differences in fat ratios in local and imported foods this results are consistent with **(Sales and Janssens, 2003).** When compared imported food and local food with different times of the same food, significant increase was observed ($p < 0.05$) at 3rd week,4th week,5th week and 6th week with compared 1st week **figure (11)** this results is confirmed by **(Carciofi *et al.,* 2003).**

Table (12) represent weight of Alexandrine parrot birds, the results showed significant increase ($p < 0.05$) of local food when compared with imported food, at 1st week, 2nd week, 3rd week, 4th week and5th week, but no significant change at 6th week, when compared imported food and local food with different times of the same food, significant Increase ($p < 0.05$) at2nd week, 3rd week, 4th week, 5th week and 6th were observed **figure (12).** The results showed an increase in the rate of absorption of protein and fat within the body of birds and this led to a high rate of growth and weight in birds this results is in agreement with **(Sales *et al* 2004 and Noha *et al*., 2016).**

Table (1-A). Components of local food by different seed, vegetable plants, oil, and digestive enzyme with determination percent

Table (1-B). The alimentary item and total energy of local food

A			B	
Local food			**Total energy of local food**	
Components of local formula		percent %	Alimentary item	Ratios
1	Yellow Corn	52%	**Protein**	24%
2	Soybean meal, solvent extracted	23%		
3	Peanut (**L,*rachis hypogae),***	1.5%	**Fat**	6%
4	Pisum sativum Dray	2%		
5	Wheat grain	8%	**Fiber**	4%
6	Palm **(Phoenix Sylvestris)**	2 %		
7	Curcuma	1%	**Ash**	7%
8	Sunflower Oil, refined	4%		
9	Soybean Oil, refined	1%	**Moisture**	9%
10	Brewers yeast	0.5%		
11	Digestive Enzyem	0.4%	**Carbohydrate**	50%
12	Mineral salt and Vitamin	2.1%		
13	Amino Acid	1%	**Total Energy**	364.6 Kcal / kg
14	Cacium phosphate,dibasic	1.5%		

Table (2). The vitamin and mineral salts of local food.

Vitamin	**Unit IU/kg**	**Mineral salts**	**Unit** (mg)
Vitamin A	**19000 IU/kg**	**Dicalcium phosphate dehydrat**	**1600 mg/kg**
Vitamin D3	**1500 IU/kg**	**phosphorus**	**2300 mg/kg**
Vitamin C	**280 mg/kg**	**magnesium**	**869 mg/kg**
Vitamin E	**200 mg/kg**	**calcium**	**9000 mg/kg**
Vitamin K3	**9 mg/kg**	**Iron**	**30 mg/kg**
Vitamin B12	**1 mg/kg**	**zinc**	**35 mg/kg**

Table (3). The total energy, vitamin and mineral salts of imported food (NutriBird A 21)

Alimentary item	percent	Vitamin	Unit	Mineral salts	Unit
Protein	21%	Vitamin A	6700 IU/kg	Dicalcium phosphate dehydrate	25000 mg/kg
Fat	8%	Vitamin D3	1200 IU/kg	phosphorus	2000 mg/kg
Fiber	3.4%	Vitamin C	240 mg/kg	magnesium	650 mg/kg
Ash	6.1%	Vitamin E	90 mg/kg	calcium	5000 mg/kg
Moisture	7%	Vitamin K3	4 mg/kg	Iron	28 mg/kg
Carbohydrate	% 54.5	Vitamin B12	0.05 mg/kg	zinc	23 mg/kg
Total energy Kcal / kg	388.15 Kcal / kg	**Notes:** the results of vitamin and Mineral salts of Imported food are in permissible limit allowed by the **NRC (1994).**			

Table (4). Digestible nitrogen retention (DNR) % of love birds as compared between imported and local food

Food time	1st week	2nd week	3rd week
Imported food	12.64.±.26 a	13.76±0.28 ab	14.36±0.8 Ab
Local food	13.08±1.23 a	14.08±1.35 ab	14.66±1.35 ab

Data presented as mean value ± standard error.
A: Significant difference when compared local food with imparted food at $P < 0.05$.
B: Significant difference at the time of the same food at $P < 0.05$.
a: No Significant difference when compared local food with imparted food.
b:No Significant difference at the time of the same food.

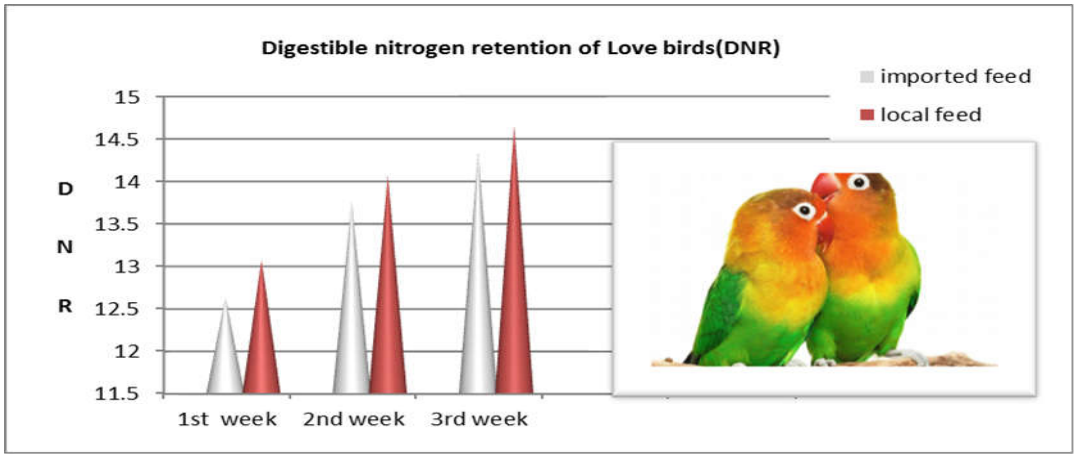


Figure (4). Digestible nitrogen retention of love birds feeding on imported and local food through three weeks.

Table (5). Fat absorption **(FA)**% of love birds as compared between imported and local food.

Food time	1st week	2nd week	3rd week
Imported food	7.38±0.28 a	7.5±0.29 ab	7.8 ± 0.35 ab
Local food	5.9 ± 0.5 A	6.16± 0.5 Ab	6.4 ± 0.5 Ab

#: The same statistical terms of table (4).

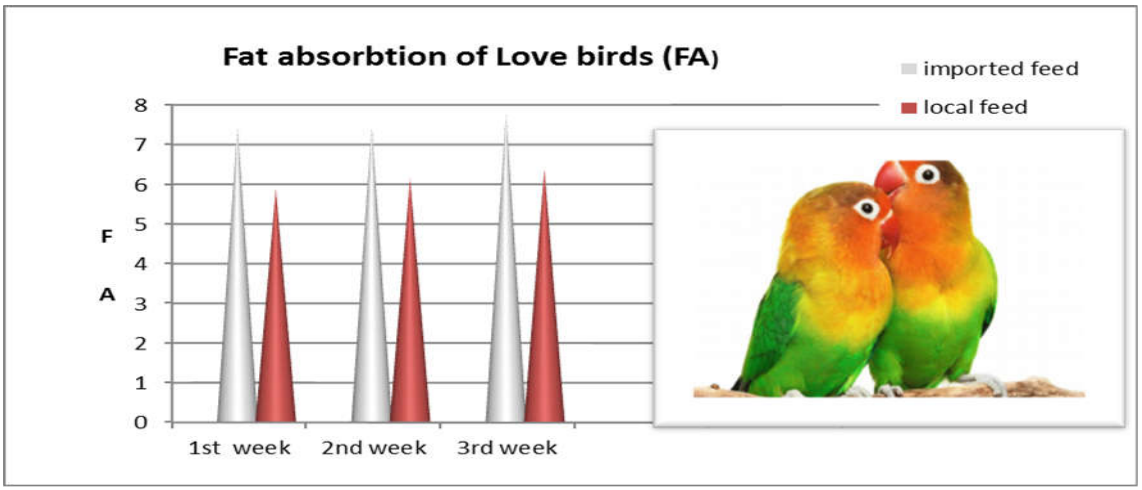


Figure (5). Fat absorption ratio of love birds feeding on imported and local food through three weeks

Table (6). The weight of the living love birds **(gm)** as compared between imported and local food.

Food time	1st week	2nd week	3rd week
Imported food	43.6±0.6 a	51 ±0.4 aB	55.8 ±0.37 aB
Local food	45± 0.5 a	51.8 ±0.37 aB	56 ±0.7 aB

#: The same statistical terms of table (4).

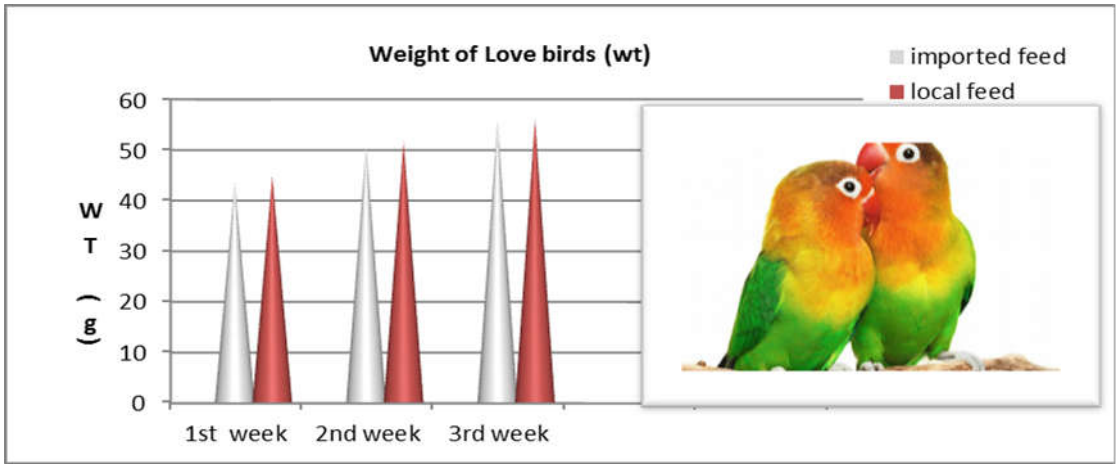


Figure (6). The weight ratio of the living love birds feeding on imported and local food through three weeks.

Table (7). Digestible nitrogen retention (DNR) % of cocktail bird as compared between imported and local food.

Food time	1st week	2nd week	3rd week
Imported food	10.1±0.29 a	12.8± 0.39 ab	13.8±0.32 aB
Local food	9.5± 1.5 a	12.5± 1.32 aB	12.9± 1.3 aB

The same statistical terms of table (4).

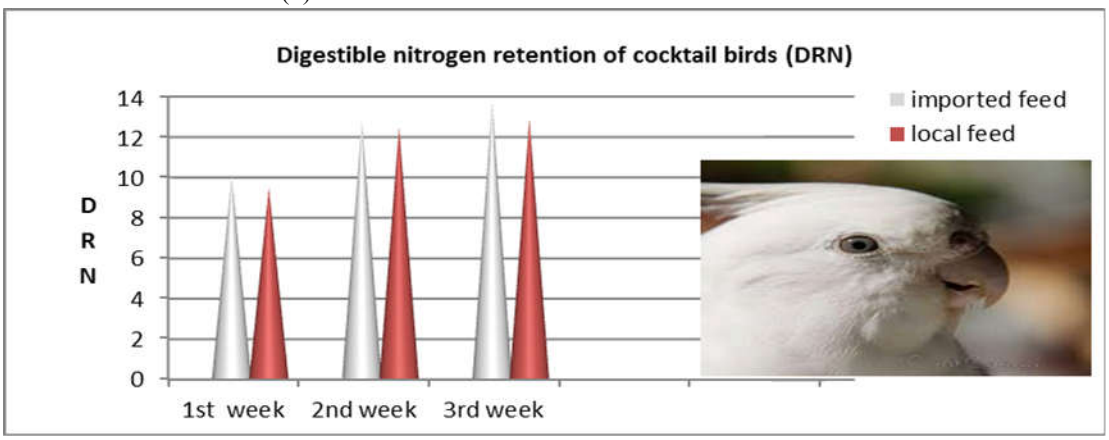


Figure (7). Digestible nitrogen retention of cocktail birds feeding on imported and local food through three weeks.

Table (8). Fat absorption **(FA)** % of cocktail birds as compared between imported and local food.

Food time	1st week	2nd week	3rd week
Imported food	5.88 ± 0.4 a	7.2 ±0.35 ab	7.4 ± 0.37 aB
Local food	3.9 ± 0.5 A	5.3 ± 0.55 Ab	5.46 ± 0.55 AB

The same statistical terms of table (4).

Figure (8). Fat absorption ratio of cocktail birds feeding on imported and local food through three weeks.

Table (9). The weight of the living cocktail birds **(gm)** as compared between imported and local food.

Food time	1st week	2nd week	3rd week
Imported food	65±0.7 a	73±1.1 aB	81.6±0.5 aB
Local food	66.4±1.02 a	74.2 ± 0.37 aB	80.4 ±0.9 aB

The same statistical terms of table (4).

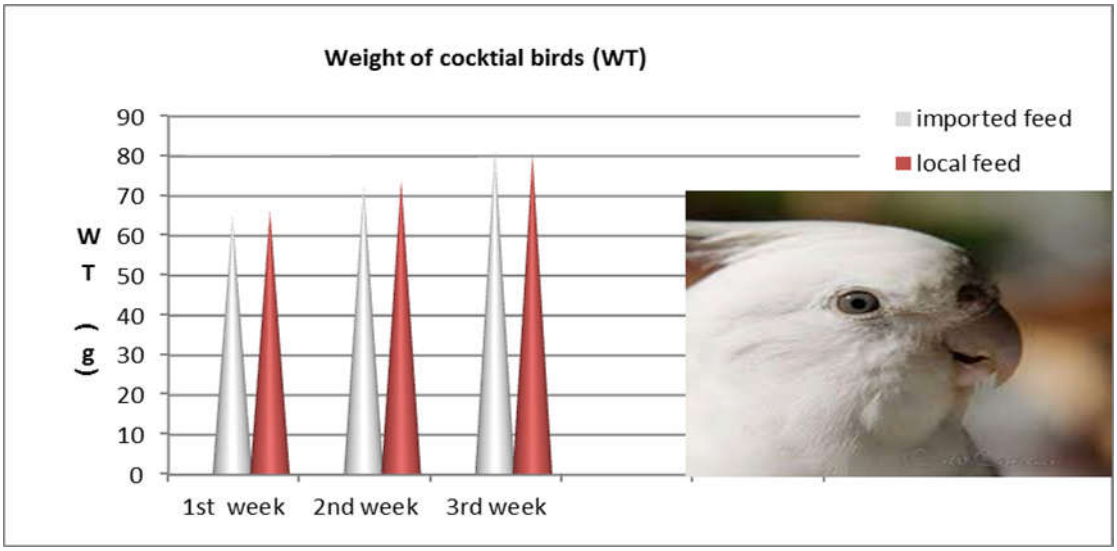


Figure (9). The weight ratio of the living cocktail birds feeding on imported and local food through three weeks.

Table (10). Digestible nitrogen retention (DNR) % of Alexandrine parrot birds as compared between imported and local food.

Food time	1st week	2nd week	3rd week
Imported food	13.36 ± 0.54 a	14.06 ± 0.46 ab	14.56 ± 0.39 ab
Local food	13.38 ± 1.2 a	14.9 ± 1.03 ab	14.5 ± 1.16 ab
Food time	**4th week**	**5th week**	**6thweek**
Imported food	14.9 ± 0.43 ab	15.4 ± 0.37 ab	16.16 ± 0.47 aB
Local food	15.56 ± 0.84 ab	15.48 ± 1.2 ab	16.14 ± 1.2 aB

The same statistical terms of table (4).

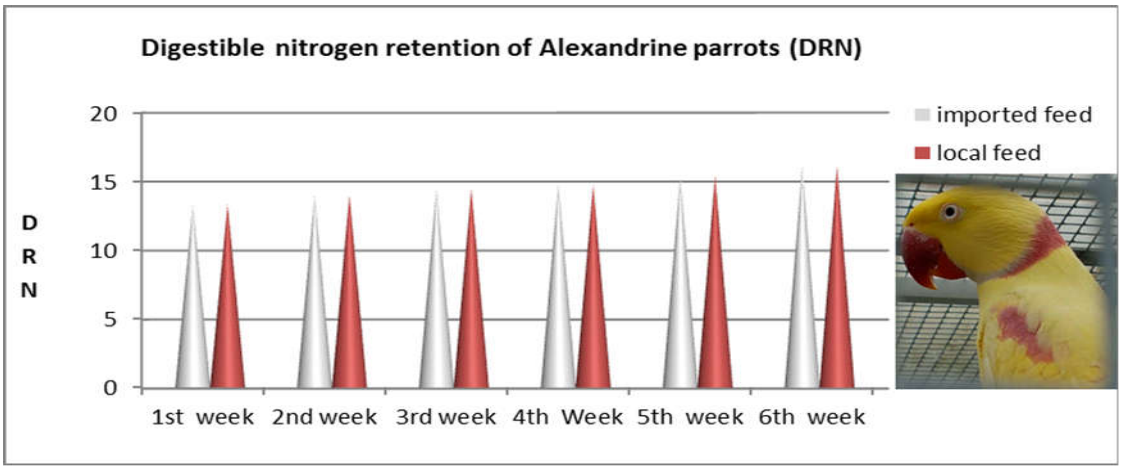


Figure (10). Digestible nitrogen retention of Alexandrine parrot birds feeding on imported and local food through six weeks.

Table (11). Percentage of fat absorption **(FA)** % of Alexandrine parrot birds as compared between imported and local food

Food time	1st week	2nd week	3rd week
Imported food	6.34 ± 0.34 a	6.9 ± 0.35 ab	7.66 ± 0.36 aB
Local food	4.24 ± 0.58 A	5.06 ± 0.52 Ab	5.7 ± 0.48 AB
Food time	**4th Week**	**5th week**	**6thweek**
Imported	8.02 ± 0.38	8.32 ± 0.34	8.6 ± 0.36
Local food	6.18 ± 0.52 AB	6.44 ± 0.49 AB	8.7± 0.51 AB

The same statistical terms of table (4)

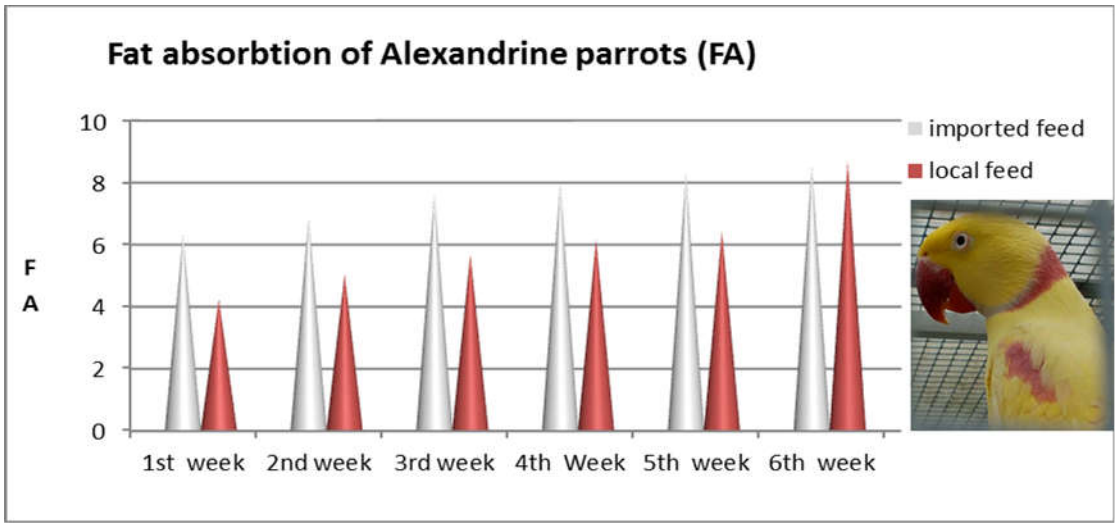


Figure (11). Fat absorption ratio of Alexandrine parrot birds feeding on imported and local food through six weeks.

Table (12). The weight (**gm)** of the living Alexandrine parrot birds as compared between imported and local feeding.

Food time	1st week	2nd week	3rd week
Imported food	85 ± 1.8 a	112.2 ± 1.3 aB	137.2 ± 1.15 aB
Local food	89.4 ±1.8 A	116.9 ± 1.59 AB	144.8±1.46 AB
Food time	**4th Week**	**5th week**	**6thweek**
Imported food	163.6 ± 1.86 aB	187 ± 1.00 aB	224.6 ± 1.5 aB
Local food	168.2± 1.77 AB	195.4 ± 1.2 AB	228.2 ± 0.86 aB

The same statistical terms of table (4).

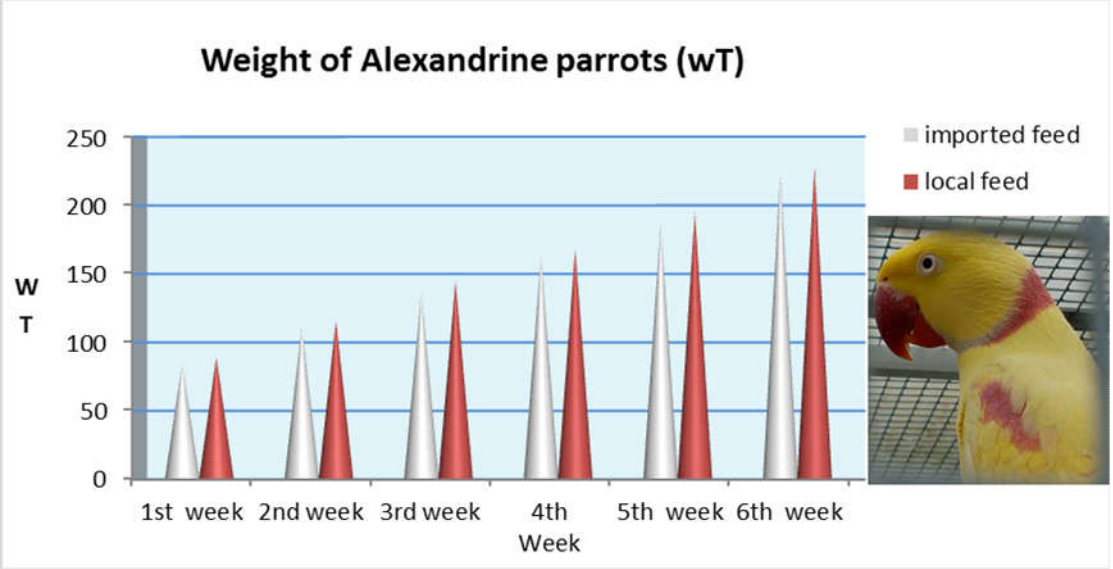


Figure (12). The weight ration of the living Alexandrine parrot birds feeding on imported and local food through six weeks.

Conclusion

The growth rate and weight of baby parrots indicate good utilization of ingested local food. The increase of digestible nitrogen retention (DRN) and fat absorption lead to an increase in the growth rate and weight of the parrot's birds, so we attempt to replace the local product and preference for the imported product.

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