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Comparison between Two Different Feed Formulations to Ensure the Growth of Young Pigeon Squabs

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Feed formulation plays a vital role in squabs of racing pigeon's growth and preparing them for the race from its young age. Some feed formulations which have more protein and fat content has the ability to improve the weight of the eggs and young squabs.
Objective: In this study, two different feed formulations were compared for the parent pigeons for its antenatal and postnatal period to ensure which is suitable and enhance the growth of the eggs and young squabs.
Methods: Two pairs of racing pigeons Pair A and Pair B have been selected. They fed with two types of feed formulations like one with a basic nutrients and another one with an addition of protein and lipid content. The weight of the eggs and the squabs of these pigeons have been measured.

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Results: The average weight of eggs in Pair B (19.16g) is higher than the Average weight of eggs in Pair A (16.75g). At the end of 20thday it was observed that the average weight of the squabs in Pair B (260.41g) is higher than the average weight of squabs in Pair A (229.59g).
Conclusion: The result showed that there is a significant weight difference in the eggs and squabs of pair A and pair B. This difference occurs due to the addition of some nutritious feed ingredients in the feed prepared for the Pair B pigeons.

Keywords: Squab; feed formulation; antenatal; postnatal.

1. INTRODUCTION

Racing pigeons are athletic birds which require a well balanced diet for its growth and racing performance. Pigeon feeds mainly consist of whole grains and seeds while minerals, vitamins and some other nutrients are provided as separate supplements [1]. Preparing a pigeon for the purpose of the race must be done from selection of the good, viable quality of parent pigeons. After selecting them a proper well balanced diet must be given from the mating process itself. This feeding process must be continued through the stages like egg laying, brooding until the Squabs reaches upto 20 days. Unlike other avian species, such as chicken or quail, squabs hatch with unopened eyes and cannot digest adult bird‘s diets [2]. The Columbidae (pigeons and doves), together with some species of flamingos and penguins, typically regurgitate milk from the crop by both parents, a highly nutritive substance being mainly composed of proteins and lipids [3-7] for the nourishment of the young ones. According to the study, 55% of the energy necessary for muscle function in pigeons is derived from the oxidation of the lipids [8]. In an experiment, in that which fat supplementation was used, racing homing pigeons receiving fat-supplemented (5%) feed surpassed the control pigeons in performance [9,10].

The main objectives of this study:

i. To observe that there is any significant weight difference between the eggs of the two pigeon pairs.
ii. To ensure the role of feed with more protein and lipid source in the growth and weight gaining in young squabs.

2. MATERIALS AND METHODS

Two pairs of one year old racing pigeons were taken and named as pair A and pair B. Pair A is fed with a simple diet of ingredients such as maize, white sorghum, green peas, wheat, groundnut, fried chick pea and pearl millet which has been shown in Table 1. Pair B is fed with a more nutrients diet in addition to the above it also contains chickpeas, mung bean, finger millet, sesame seed and sunflower seed which has been shown in Table2. Pair B is also supplemented with a feed additives of oyster shell powder and egg shell powder. This oyster shell powder and egg shell powder which is a rich source of calcium carbonate which is helpful in the formation of a solid eggshell for a pigeon and for its digestion [11]. A small amount of paddy (1-2%) is added with the feed which enhances the formation of the egg after mating. This feed pattern was followed from the process of mating throughout egg laying, hatching, brooding until the 20 days of growth of young squabs. This is because the parent pigeons mostly take care and feed the young ones until 20 days or the beginning of the next breeding cycle.

The feed intake of pigeons range from 50 – 55g per day during the antenatal stage. This feed intake reduces to 35 – 40 g per day because of the brooding process. Again there is a intake in feed upto 60 - 65 g per day during the postnatal

Table 1. Feed ingredients and their percentage for Pair A pigeons

S. No.	Feed ingredients	Percentage (%)
1	Maize	40
2	White sorghum	12
3	Green peas	12
4	Wheat	5
5	Groundnut	10
6	Fried chick pea	10
7	Pearl millet	11

Table 2. Feed ingredients and their percentage for Pair B pigeons

S. No.	Feed Ingredients	Percentage (%)
1	Maize	20
2	White sorghum	10
3	Green peas	10
4	Wheat	5
5	Groundnut	10
6	Fried chick pea	5
7	Pearl millet	5
8	Chickpeas	10
9	Mung bean	5
10	Finger Millet	10
11	Sesame seed	5
12	Sunflower seed	5

period due to the crop milk production and feeding of the squabs.

The weight of the eggs of both pairs of pigeons were measured. The weight of the squabs has been also measured at the intervals of Day 1, 5, 10 and 20. This weight measurement has been done with a standard digital balance.

Fig. 1. Pair A: (a) An one year old pigeon pair, (b) Eggs of Pair A pigeons (c) Brooding period, (d) Day after Hatching, (e) 5th Day, (f) 10th Day, (g) 20th Day

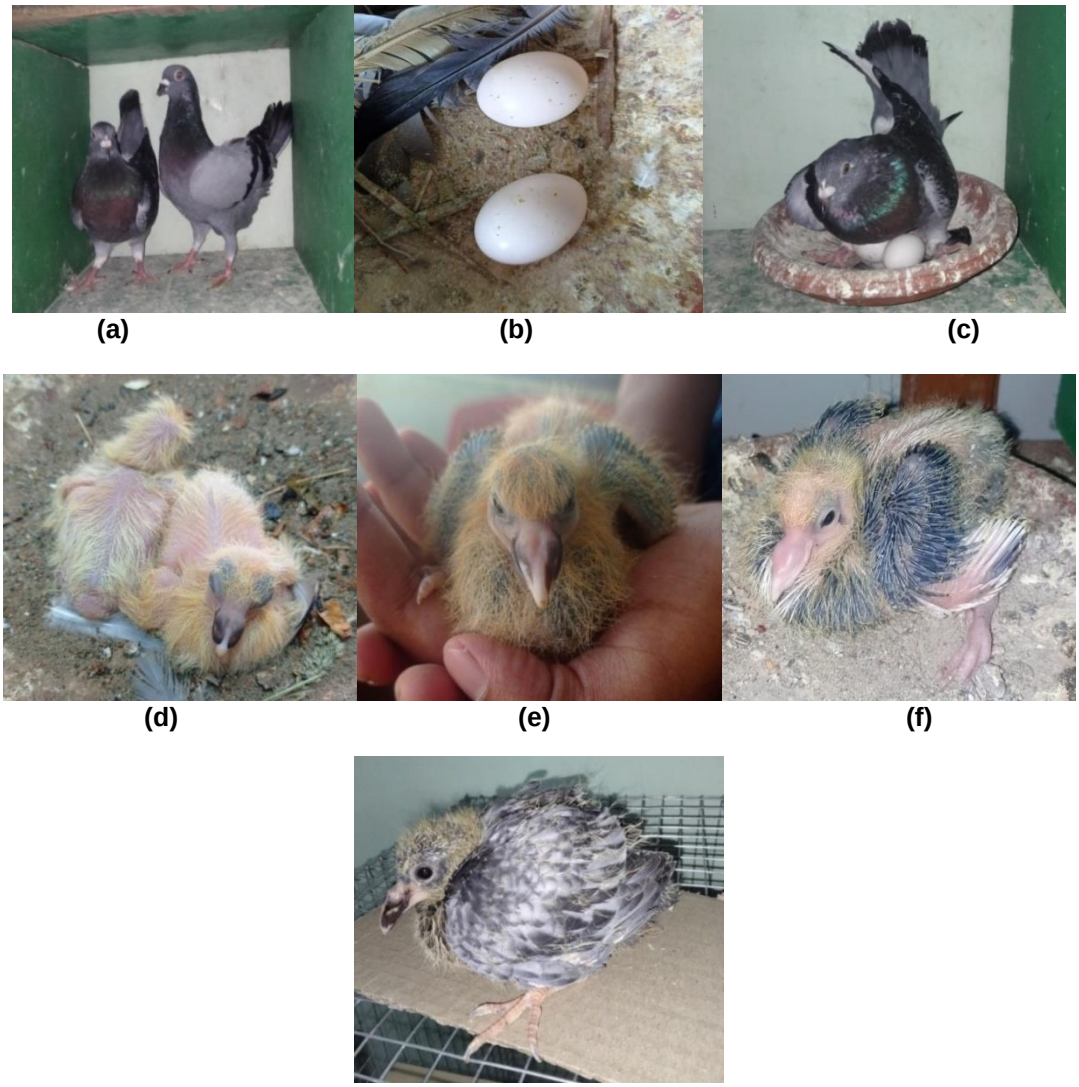


Fig. 2. Pair B: (a) An one year old pigeon pair, (b) Eggs of Pair B pigeons (c) Brooding period, (d) Day after Hatching, (e) 5th Day, (f) 10th Day, (g) 20th Day

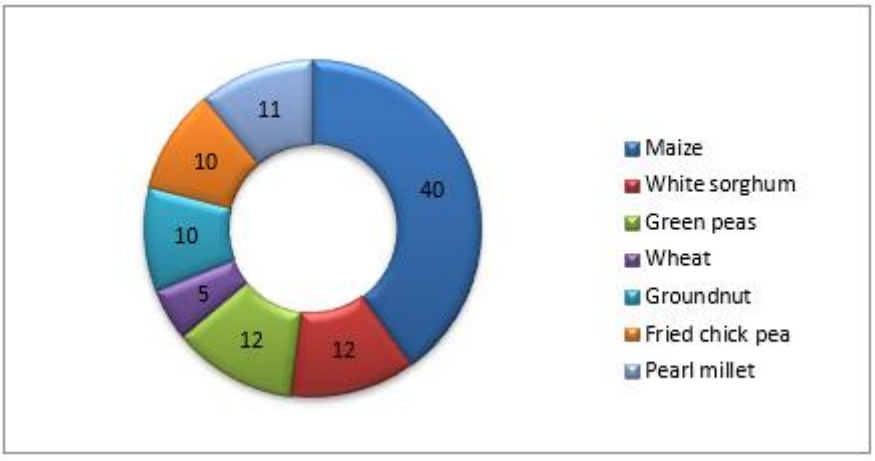


Chart 1. Feed ingredients and their percentage for Pair A pigeons

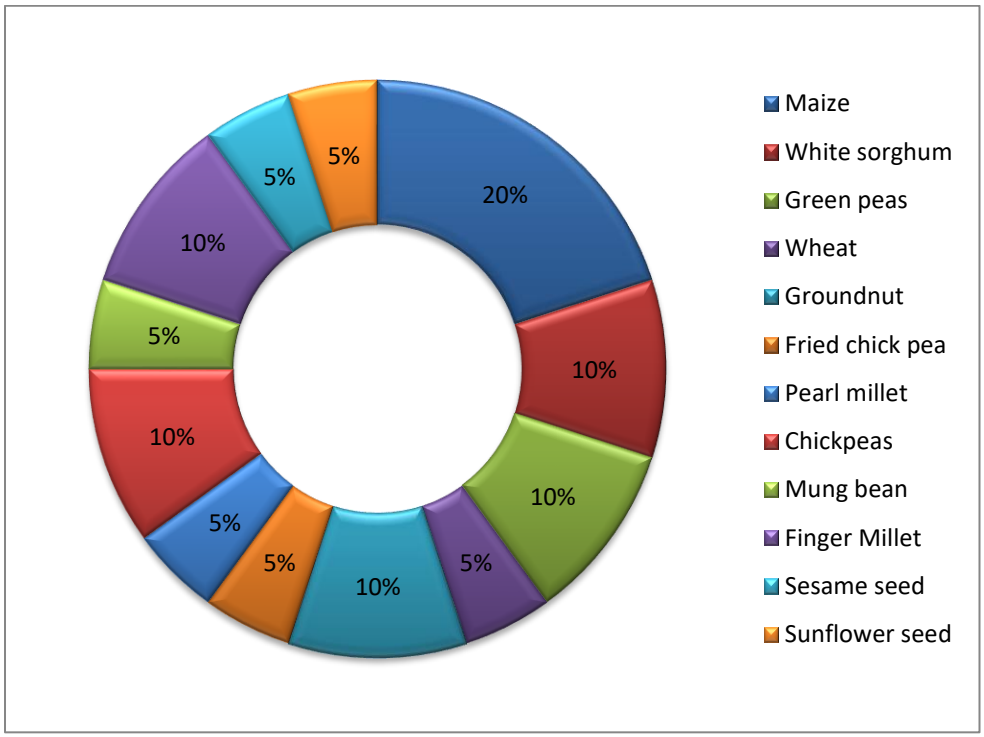


Chart 2. Feed ingredients and their percentage for Pair B pigeons

3. RESULTS AND DISCUSSION

Data presented in Table 4 and Table 5 showed that the effect of feed additives on the weight gain in pair A and pair B. It was observed that the average weight of eggs in Pair B (19.16g) is higher than the Average weight of eggs in Pair A (16.75g). At the end of 20thday it was observed that the average weight of the squabs in Pair B (260.41g) is higher than the average weight of squabs in Pair A (229.59g). This clearly showed that the impact of protein, fat and calcium carbonate in egg shell played a vital role in the building up of bones and muscles of squabs, through the crop milk given by their parents.

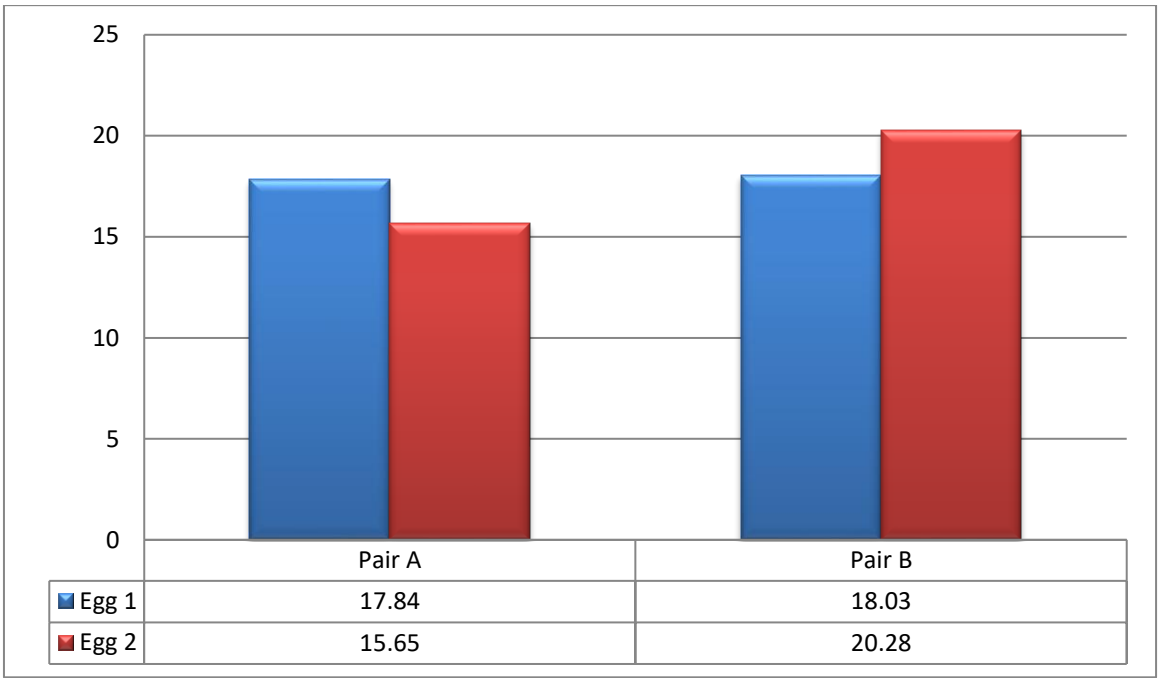
Table 3. Nutrient content of the feed ingredients

S. No.	Feed ingredients	Protein (g)	Fat (g)	Fibre (g)	Carbohydrates (g)	Energy (Kcal)
1	Maize	9.42	4.74	7.3	74.26	365 [12]
2	White sorghum	11.3	3.3	6.3	74.3	339 [13]
3	Green peas	5.42	0.4	5.1	14.46	84 [14]
4	Wheat	15	1.9	12	68	329 [15]
5	Groundnut	24	50	8.4	21	587 [16]
6	Roasted Bengal gram	19	6	17	61	369 [17]
7	Pearl millet	11	4.2	8.5	72	378 [18]
8	Chickpeas	9.54	2.99	8.6	29.98	180 [19]
9	Mung bean	23.86	1.15	16.3	62.62	347 [20]
10	Finger millet	7.30	1.30	11.50	72	328 [21]
11	Sesame seed	16.96	48	16.9	26.04	567 [22]
12	Sunflower seed	20.8	51.5	8.6	20	584 [23]

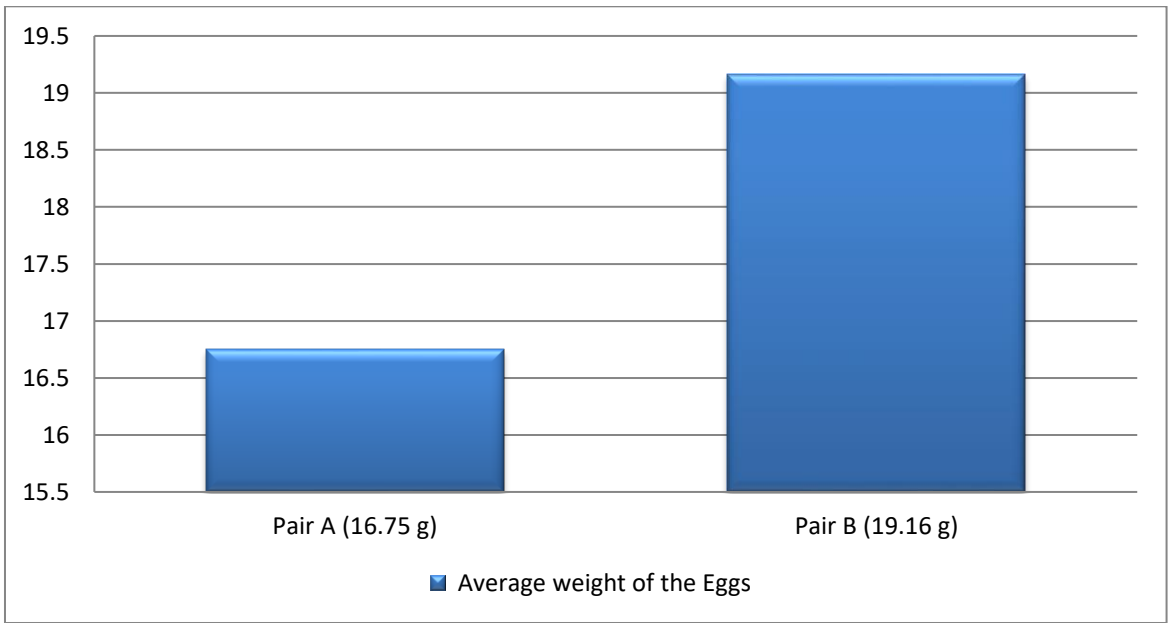
Source: Secondary data (reference 12-23)

Table 4. Weight of the eggs

Pigeon pairs	Pigeon Eggs	Weight of egg (g)	Average (g)
Pair A	Egg 1	17.84	16.75
	Egg 2	15.65	
Pair B	Egg 1	18.03	19.16
	Egg 2	20.28	



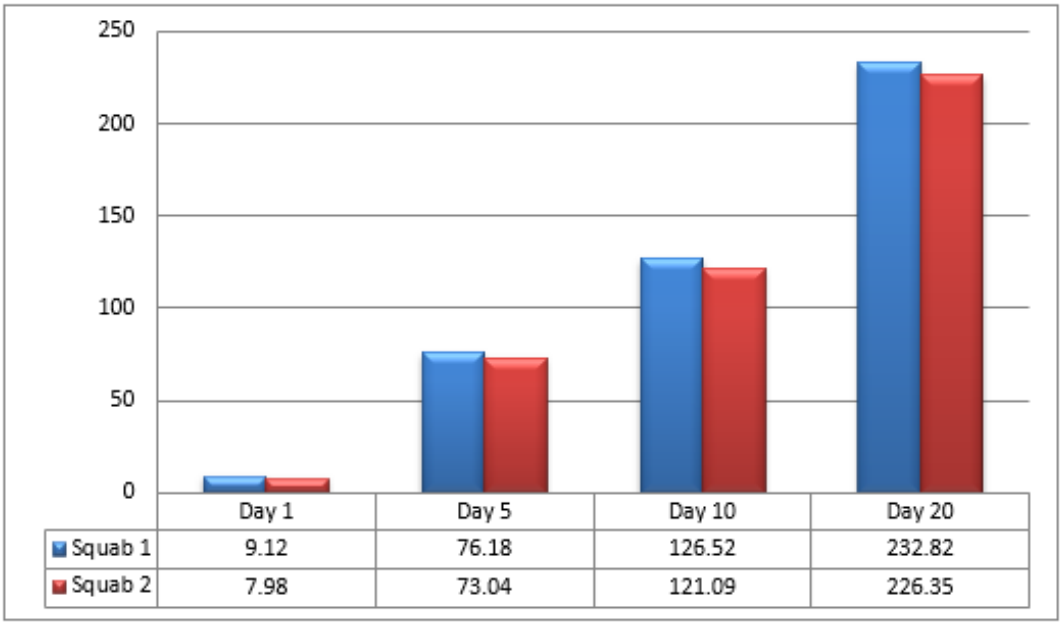
Graph 1. Comparison of Weight difference in the Eggs of both pair A and pair B



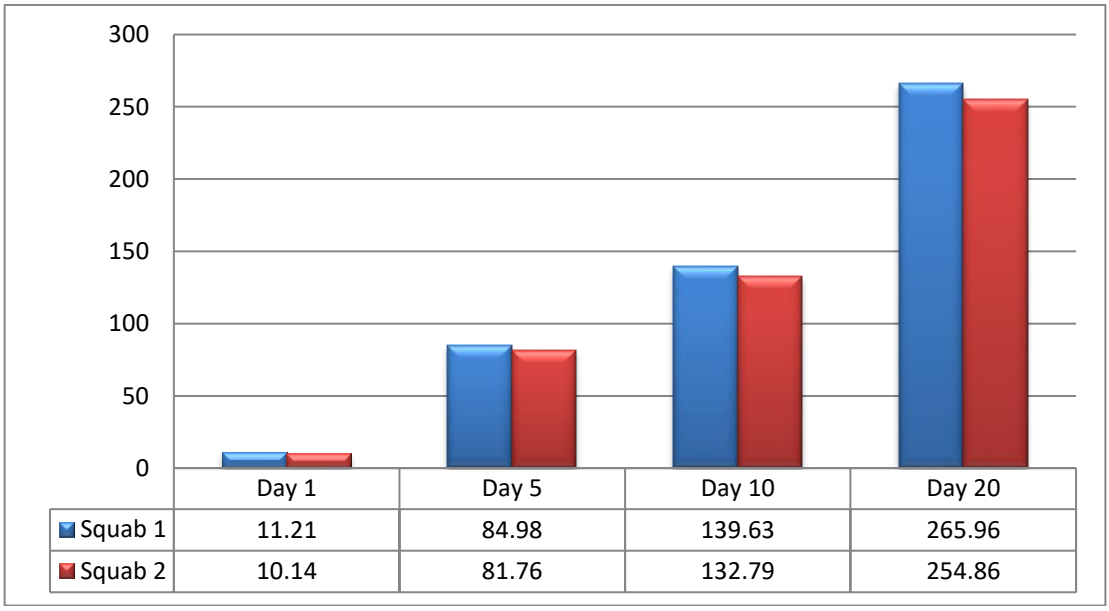
Graph 2. Average weight difference between the Eggs of the Pair A and Pair B

Table 5. Weight of the birds from hatching to 20 days

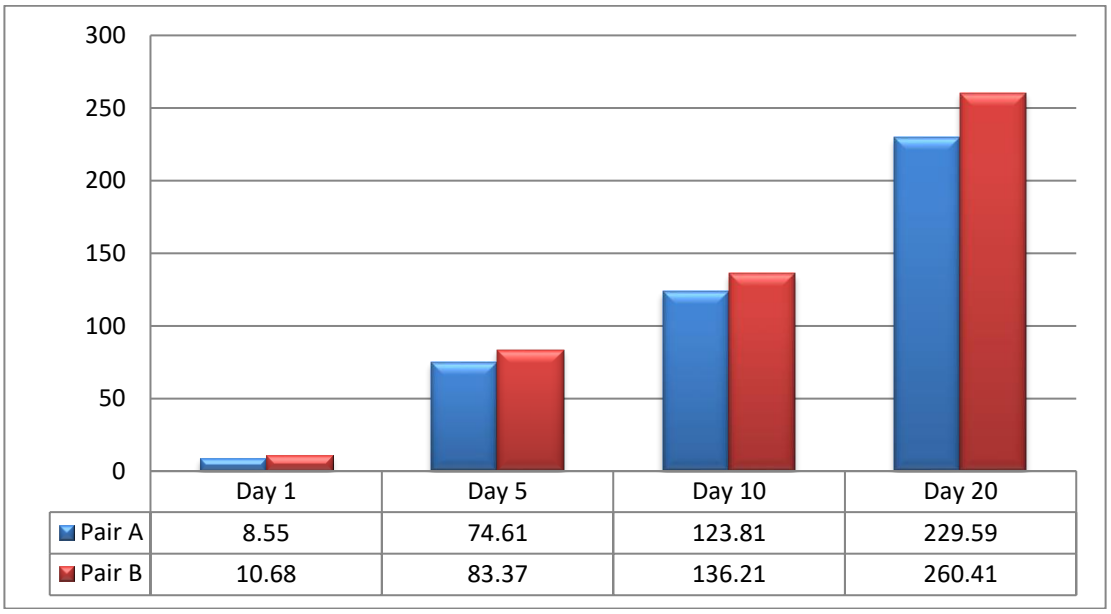
Time Interval	Pair A		Average weight of pair A Squabs (g)	Pair B		Average weight of pair B Squabs (g)
	Squab 1 (g)	Squab 2 (g)		Squab 1 (g)	Squab 2 (g)	
Day 1	9.12	7.98	8.55	11.21	10.14	10.68
Day 5	76.18	73.04	74.61	84.98	81.76	83.37
Day 10	126.52	121.09	123.81	139.63	132.79	136.21
Day 20	232.82	226.35	229.59	265.96	254.86	260.41



Graph 3. Comparison of weight in the squabs of Pair A



Graph 4. Comparison of weight in the squabs of Pair B



Graph 5. Average weight difference between the squabs of Pair A and Pair B

This weight difference in these two pairs is because of the addition of nutritious foods like mung bean, sesame seed and sunflower seed which is rich in protein and fibre content and 5% oil seeds like sesame seed, sunflower seed in the feed which is rich in lipid content. Pigeons can utilize lipids more efficiently than carbohydrates because of the bile production in liver can adapt to the changing demands in a versatile manner [24]. Oyster dust larger than 6 mm must be added for its digestion [11].

4. CONCLUSION

In this study, the result showed that there is a significant weight difference in the eggs and squabs of pair A and pair B. This difference occurs due to the addition of some nutritious feed ingredients in the feed prepared for the Pair B pigeons. It contains some high protein rich mung bean, sesame seed and sunflower seed. It also contains some quality lipid rich sesame and sunflower seed. Protein and lipid play a vital role in the growth and flight performance of a racing pigeon. The feed ingredients like mung bean, finger millet and sesame seed has enough fibre content which regulates the intestinal tract activity of pigeons.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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