





**TÜRKİYE TABİATINI KORUMA DERNEĞİ**  
**TABIAT VE İNSAN DERGİSİ**  
***JOURNAL OF NATURE AND MAN***  
**2023 2(194)**

**FEEDING BEHAVIOURS OF BIRDS LIVING IN CITIES: AN EXAMPLE  
OF THE LAUGHING DOVE (*Spilopelia senegalensis* Linnaeus, 1766)**

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**Referans:** Yapıcı N. and Erdoğan A. (2023) Feeding behaviours of birds living in cities: An example of the Laughing dove (*Spilopelia senegalensis* Linnaeus, 1766). *Tabiat ve İnsan*, 2(194), 67-75.

## Feeding Behaviours of Birds Living in Cities: An Example of The Laughing Dove (*Spilopelia senegalensis* Linnaeus, 1766)

### Abstract

Observations show that cities are habitats for many species. Birds, which are one of the most important members of these species are starting to turn into a more domestic form compared to many of their congeners thanks to the life in the cities, although they are in the status of wild animals. The human factor that they share the same environment with has a great effect on this. Many genres with city life; It is faced with consequences such as getting used to people, finding readymade food, living in noise and air pollution, unbalanced nutrition, risk of disease and spreading to wider areas, abnormal increase in populations and negative effects on biodiversity. The positive and negative aspects of the results of this situation need to be investigated. Awareness raising of people on bird feeding in wildlife and a feeding program should be implemented through certain institutions. Man-made feeding should be abolished, and birds should be allowed to live in their natural habitats, excluding extreme climatic conditions or others naturel disasters.

**Keywords:** Birds, wildlife, towns, townspeople

### Şehirlerde Yaşayan Kuşlarda Beslenme Davranışları: Küçük Kumru (*Spilopelia senegalensis* Linnaeus, 1766) Örneği

### Özet

Yapılan gözlemler, şehirlerin birçok türün yaşam alanı olduğunu göstermektedir. Bu türlerin en önemli üyelerinden biri olan kuşlar, yaban hayvanları statüsünde yer alsalar da şehirlerdeki yaşam sayesinde birçok türdeşlerine göre daha evcil bir şekle dönüşmeye başlamaktadırlar. Aynı ortamı paylaştıkları insan faktörünün bunda büyük bir etkisi olmaktadır. Şehir yaşamı ile birçok tür; insanlara alışmak, hazır yem bulmak, gürültü ve hava kirliliği içerisinde yaşamak, dengesiz beslenmek, hastalık riski ve daha geniş alanlara yayılması, popülasyonlarının anormal artması ve biyoçeşitliliğe olan etkileri gibi sonuçlarla karşı karşıya kalmaktadır. Geline bu durumun sonuçlarının olumlu ve olumsuz taraflarının araştırılması gerekmektedir. Yaban hayatında kuş besleme konusunda kişilerin bilinçlendirilmesi ve belli kurumlar aracılığı besleme programı uygulanması ya da insan eliyle besleme etkinliğinin kaldırılarak kuşların extrem iklim koşulları ya da doğal afetler hariç doğal ortamlarında yaşamalarının sağlanması oluşturulmalıdır.

**Anahtar Kelimeler:** Kuşlar, yaban hayatı, kasabalar, kasaba halkı

### 1. INTRODUCTION

Birds in the vertebrate group have to take protein, carbohydrates, vitamins, minerals, oils, and water, which are necessary for a healthy organism (Kuru 1999; Kutlu 2015). Commercial feeds prepared for pets are created in this direction. While preparing these feeds, characteristics such as the age, sex, and reproductive period of the animal, whether it has been sterilized or not are taken into consideration. Even the grain sizes of the feeds to be given vary according to the size or age of the animals (Kutlu, Şahin 2017). Birds living in the wild have to find these nutrients themselves, which are necessary for their organisms. This is necessary for them to live and continue their generation. Therefore, when choosing a habitat for themselves, their priority is the availability of these food sources.

Forests, wetlands, mountains, plains, etc. are wild areas that have formed naturally. The grasses, seeds, fruits, and animals (both vertebrate and invertebrate) that grow in these areas serve as natural food sources for birds (Aslan et.al 2006). The water they drink and the air they breathe in these areas are also cleaner. On the other hand, urban ecosystems are places where concrete piles, artificial parks, people, light, noise, and pollution are more common. As in every ecosystem, there are living beings that have adapted to city ecosystems. Species that have adapted to these environments have acquired different characteristics compared to their other congeners living in nature. For example, they fly over shorter distances, have higher survival rates, and possess wider breeding ranges, exhibit wider distribution patterns, discover new ways of obtaining food, have stronger immune systems, and have a greater dependence on these environments (Jones, Reynolds 2008; Moller 2009).

Feeding of wild birds first began in northern countries as a result of the extremely cold weather and snow everywhere. Different mixtures of seeds, fruits, and meat suitable for birds were left in special containers or hung on trees where birds were concentrated. Over time, this business has become a sought-after industry. It is stated that the annual cost of bird feeding in the USA is over 3000 million dollars (Fuller et.al 2007; Jones, Reynolds 2008). In addition to the feeds used in bird feeding, it is necessary to add the cost of some legumes such as wheat, bulgur, and sesame. Besides, household and pastry residues are also given to the birds as fodder.

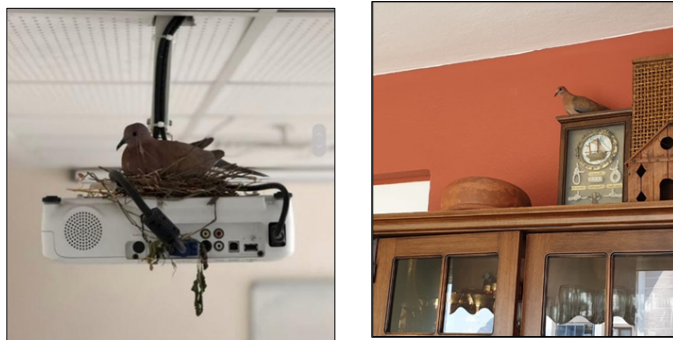


Figure 1. Laughing doves that nest and settle indoors

One of the bird species we have seen most in urban life in recent years is the laughing dove (*Spilopelia senegalensis*). The homeland of this species, which was first recorded in Turkey in the 1960s and 1970s, is Africa and the Arabian Peninsula, which are among the driest regions of the world (Kasperek 1991). There are records indicating that it is currently found in all regions of Turkey (Kiziroğlu 2008, 2009; Yeni, Erdoğan 2010b). The laughing dove, can easily adapt to the urban ecosystem and people, primarily prefers old settlements. The species, which generally considers the gaps between buildings as their living space, uses the recesses on the upper parts of the buildings, the front of the windows, the backs of the air conditioners, the flowerpots on the balconies, and even the appropriate places inside the houses as a nesting place (Figure 1). However, it also has an ancestral ability to nest in trees (Shoham et al. 1997; Yeni, Erdoğan 2010a; Ayadi et al. 2016; Yapıcı, Erdogan 2023).

This study has been prepared according to the results of the study based on 15 years of observations and conversations with people in Antalya province and its surroundings. During these observations, pictures were taken and questions revealing the situation were asked to the people. The thoughts and opinions about how the laughing dove are fed in the cities, which foods it prefers, and the results of this situation are presented in this study.

## 2. MATERIAL AND METHOD

In this study, the qualitative analysis method was used on the data obtained based on the information and observations obtained from the studies carried out for approximately 15 years in the province of Antalya and its surroundings and the campus of Akdeniz University. Especially, in this observation made in 2018-2019, every week in the central districts of Antalya (Muratpaşa, Konyaaltı) and every 3 months in other districts (Kaş, Kumluca, Demre, Finike, Kemer, Korkuteli, Elmalı, Döşemealtı, Kepez, Aksu, Serik, Manavgat, Alanya, Gazipaşa, Akseki, İbradı, Gündoğmuş) field observations were carried out. During these field observations, photographs were captured by maintaining a stationary position for a certain period of time at a particular corner within the areas where laughing dove communities were under observation. Questions were asked to residents of the area who were interested in the dove. As a part of the study's observation criteria, nutritional behaviours, feed preferences, and human factors were considered. Additionally, the study examined the influence of human factors on the eating habit of laughing dove.

## 3. RESULTS AND DISCUSSIONS

### 3.1. Feeding Behaviours and Feed Preferences

Reliable environments with abundant feeding opportunities, allow the species to spread more rapidly in these regions. Especially species such as laughing doves, which can reproduce in all seasons of the year and can easily adapt to the environment, make better use of these opportunities. Among the bird species that share the same environment with laughing doves, we can count *Streptopelia decaocta* (Ringed dove), *Columba livia* (Rock pigeon), *Passer domesticus* (Sparrow). These species exhibit similar behaviours in terms of nutrition.



Figure 2. Feeding of laughing dove by humans

Due to its location, Antalya has a temperate climate. It is a city with natural vegetation, orchards, and agricultural areas. While the districts in the south of the province are lined up parallel to the seacoast, the north has a continental climate with its back to the mountains. In such a geography, it is impossible for birds to have any problems with feeding (Kaçar et al. 2004). Many species that came and settled in urban environments, were also performing their feeding behaviours thanks to their ancestral instincts before the cities became so concrete or the human population increased.

In conversations about birds with people living in cities; It has been determined that with the advancing human age, activity decreases, leisure time and interest in the environment increase. In concordance with this, it is observed that there is an increase in the feeding behaviour of animals, especially birds (Figure 2) (Galbraith et al. 2014).



Figure 3. Laughing dove on the fruit trees in nature (a; wild berries, b; pomegranate tree)

The feeds that people give to feed the doves, cause the bird populations in this region to increase over time. Areas such as breadcrumbs or sesame spilled around bagel cars and bakeries, crumbs on the floors of cafes and canteens, fruit and vegetable scraps spilled on the ground at farmers' markets, garbage residues around garbage containers, and pet shops are among the places where laughing doves live the most. The most important reason why they are dense here is that they are close to food sources. Seeds, commercial products (wheat, sesame, bulgur, etc.), small-grained fruits (mulberry, grape, etc.), human food residues (bread, cake crumbs, leftovers) are the most consumed feed in cities. It has been observed that most of these products are given voluntarily by people and over time become addictive. The only nutrient we have detected differently in our observations is the food put on the streets for cats and dogs. It has been determined that these foods, which are prepared in the most appropriate way for pet animals, are consumed intensively by doves (Figure 4). In addition to wild seeds, the seeds and fruits of plants and trees planted for landscaping are also sources of food (Figure 3).



Figure 4. Laughing dove eating cat food

In order to reveal the feeding habits of this species, a study was carried out in the Barberspan region of Africa, which lasted from 1976-July to 1977-June (1 year). Each month, the stomach, and contents of 10 doves on average were stored in 70% ethanol, and the samples for each bird were examined separately, and the data obtained from 118 adult laughing doves at the end of 1 year were evaluated as follows. The most concentrated foods in the stomach contents; wild and commercial seeds (sunflower seeds, maize), grass (*Eleusine indica*), insects, larvae, pupae (*Musca domestica*), termite (*Hodotermes mossambicus*) and small shelled snails (*Succinea*

*striata*). Black- and buff-coloured seeds smaller than 2 mm in diameter were preferred. It has been determined that egg laying females prefer feeds of animal origin. In addition, the energy requirement of a laughing dove was calculated as 68.15 kcal/day (Dean 1979).



Figure 5. Laughing dove eating from trial dishes

It has been determined that wheat, coarse bulgur, fine bulgur (brown, yellow), sesame (with or without shell) and cat or dog food are given to laughing doves by humans in Antalya province. In a different study, flour worms (*Tenebrio molitor*) were added to these foods and placed in 17 different localities on 8 different plates, and which foods they preferred first were investigated (Figure 5). Accordingly, wheat (24.4%) and cat food (22.5%) were determined among the most preferred foods of the species. There was no significant difference between shelled sesame, unshelled sesame and bulgur. The two least preferred foods are fine brown and yellow bulgur. Live bait (*Tenebrio molitor*) was placed on the plates as 15 pieces. These plates were placed in only 8 localities. It was determined that  $9.75 \pm 4.62$  pieces were consumed on average. It has been observed that in the localities where live bait is placed, they prefer this bait as the last option. It was thought that the fact that this experiment was carried out in the autumn-winter period affected the live food preferences of the doves. In addition, it was determined that they consumed dark-colored foods (58.5%) more than light-colored foods (41.5%) (Yapıcı 2020).

### 3.2. The Human Factor in The Nutrition of Laughing Doves

The alienation of people from natural life with city life, the confinement of concrete piles and technology cause an increase in interest in the natural environment, especially wildlife. Especially cats, dogs, and birds, which are among the most important representatives of wildlife, attract attention in their daily work. The easiest way to approach them is to feed them and interact with them. In this way, if he is under stress, has depression or is in a similar mood, he can somehow treat himself.

Birds are the most intensely fed creatures by humans. In the observations we made in the city centre and districts, bird groups can always be encountered in areas such as the fronts of shops, house balconies and glass fronts. The people who feed the birds say that they allocate a certain part of their budget to this work, and 1-2 doves reach tens in time. Although people are happy by feeding the birds in this way, it is necessary to take into account the situations they will encounter later.

Feeding the same type of food continuously (pastry leftovers, wheat and its derivatives, bread, etc.) will adversely affect the immune system of the birds, as one-way feeding takes place, and this may cause many diseases. In addition, it is important for hygiene that the feeds given are thrown on the ground and the containers start to mold on the street corners for days (Figure 6). During the times when the food is given, there may be large dove communities in these areas.



Figure 6. Food scraps put on the streets by people for birds and others

There is a high probability of sick birds in these communities. This is an important phenomenon in terms of the increase in the disease. In addition, the feed spilled on the roads (wheat, bulgur, rice, etc.), cat and dog foods can also be a food source for rodents such as mice, rats, hedgehogs, or insects such as ants and cockroaches, and may cause an increase in their numbers (Galbraith et.al. 2014).



Figure 7. Doves, pigeons, sparrows (a; Cumhuriyet area, b; campus of Akdeniz University)

During such feedings, other bird species (pigeons, other ringed doves, sparrows) are also seen among the large dove communities (Figure 7). The increase in the number of especially small bird species and some rodents causes some raptors (crows, owls, kestrels, hawks, etc.) to come to that region. In addition, it has been determined that bird feeding has a negative effect on biodiversity (Erdoğan 1990; Parsons et.al 2006; Evcilmen et.al 2015).

One of the consequences of humans feeding the doves this way is thought to be such rapid the proliferation of dove populations. Antalya has a temperate climate and there is no problem in finding feed, creating a suitable environment for doves to breed in every season of the year. In another study we conducted in the central districts of Antalya, hatching success of laughing doves was calculated in two different ways, as 89.55% and 94.14%, respectively, according to total eggs and hatched eggs (Yeni, Erdoğan 2010a; Yapıcı, Erdoğan 2023). These results were higher than the results obtained in countries whose homeland is Africa, Arabia, and India (Dean 1980; Rao 2014; Brahmia et al. 2015). Increasing the food supply has extended the breeding period and increased the number of offspring produced per year (Jones, Reynolds 2008). Another result we obtained from our observations is that doves become dependent on feed over time. It has been observed that when they are not fed, they come to the same places at the same time and exhibit waiting behaviour.

#### 4.CONCLUSION

One of the major reasons for the rapid spread of the laughing dove, whose population has been increasing and whose habitat has expanded throughout Turkey in recent years is the availability of its nutritional needs and suitable environmental conditions. As observed with the laughing dove example, while the short-term feeding of birds or other living organisms by humans may have positive effects for the birds and bring happiness to people, in the long term, it can negatively impact the ecosystem we inhabit. Excessive population growth in certain species may lead to a decline in other populations, while simultaneously causing an increase in some larger predatory species.

On the other hand, to ensure that laughing doves and other species maintain their natural behaviours and abilities, their interactions with humans should not exceed certain limits. While we may be interested in wildlife, it is important to remember that wildlife operates by its own set of rules. In some cases, such as fires, bad weather conditions, and natural disasters there may be minor touches for them. If these touches last longer than necessary, they can disrupt the natural balance. Species must prefer their natural habitats rather than human habitats, choose their food from wild seeds, and fruits, and eat other insects or rodents. If they build their defences on or near these environments, they are able to perform this way of feeding. Furthermore, it is believed that people's close relationships with such living organisms can lead to an increase in various diseases. For instance, certain ectoparasites residing on birds appear to contribute to the rise of conditions like allergies and asthma. Considering all these points, conducting research on this subject and disseminating knowledge to societies becomes crucial.

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