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Authors: Olech, Bogumiła, and Pruszyński, Mikołaj

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Food caching or surplus killing in the Common Buzzard *Buteo buteo*?

Bogumiła Olech[1] & Mikołaj Pruszyński[2]

[1]Kampinoski National Park, Tetmajera 38, 05–080 Izabelin, POLAND
[2]Field Station, Institute of Ecology Polish Academy of Science, 05–092 Łomianki, POLAND

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Abstract. In some Buzzard nests with nestlings, located in the Kampinoski National Park, surplus food was found — two or more items of small rodents, mainly voles, without traces of damage, stored in nests. Part of the stored prey was in various stages of decay. Surplus prey items were more frequent in farmland nests than in forest nests.

Key words: Common Buzzard, *Buteo buteo*, food caching, surplus killing

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INTRODUCTION

The food caching during breeding provides a buffer against temporary food shortages, and thus acts to secure an even flow of energy to the female or the nestlings (see Källander & Smith 1990, for references). Surplus food can affect clutch size, hatching or fledging success (Newton & Marquiss 1981, Aparicio 1994, Gehlbach & Roberts 1997) or frequency of chicks' feeding (Rejt et al. 2000). It is also known that temporally or spatially clumped distribution of food may enhance the food storing (Källander & Smith 1990).

MATERIAL AND METHODS

The materials were collected in the Kampinoski National Park, central Poland. During three breeding seasons (1998–2000), 48 Buzzard nests with 2–4-week old young located in the forest (27 nests) and at the farmland or forest edge (21 nests) were checked, and all prey remains were collected. In total, 122 prey remains or untouched prey items were found (from 0 to 23 items per nest).

RESULTS

The major food of Buzzards in the Kampinoski Forest, as estimated from prey remains in nests, consisted of birds and small mammals, but also amphibians, reptiles, invertebrates, and pieces of carrion of larger prey were recorded. During the three study years no prey remains were found in about 20% of nests (Table 1). In other nests only feathers, hair, fragments of skin, bones, or legs were present. Most prey items were almost completely eaten (remains only in pellets), some were in the course of eating. Also prey items without noticeable traces of damage were recorded. In some cases young Buzzards were actually sitting on untouched prey without showing any interest in them. These prey items were mainly rodents, i.e. four adult voles *Microtus agrestis* and/or *M. oeconomus*, or the Common Vole *M. arvalis,* and three Bank Voles *Clethrionomys glareolus* with a joint weight of 69 g. Moreover, in such nests single untouched slow-warms *Anguis fragilis*, frogs, or lizards were found too. In an extreme case 23 individuals, including 18 females of large voles (*Microtus agrestis/oeconomus*) were found in the nest located in a clump of alders on vast unmown meadows and tree-stand cultures. Some prey items were in various stages of decay, thus they must have been brought to the nest much earlier than other, fresh ones.

In total, among 27 nests located in forest interior, surplus food (two or more untouched prey items) was recorded in four nests (15%), whereas among 21 nests located in farmland, surplus food was found in eight nests (38%).

DISCUSSION

It is a matter of discussion what number of prey items temporarily unused in the Buzzard nest can be an evidence of food caching. Usually two or more items are considered a limit. This is reasonable for species with a clear reversed sex dimorphism, in which the male provides food for the female and the young, bringing single prey items to the nest. The prey is distributed and eaten immediately. But also in these species the male can deliver food in the nest when the female is absent, and wait until the female tears it up, as it can be the case in *Accipiter nisus* (Newton 1986). In Buzzards, that show small differences in body size between the sexes and the female hunts in breeding season as well, two prey items in the nest may signify that both parents just brought the prey and were flushed by the observer. Thus, it would be safer to set a limit at three or more prey items. In this case, the scale of the phenomenon will drop from 25% of the nests with surplus food to 14%, but most of these nests are still in farmland. Many authors (e.g., Jędrzejewski et al. 1994, Graham et al. 1995, Swann & Etheridge 1995) ascribe variation in the breeding success of buzzards to cyclic changes in high densities of rodents in open areas but not in forests. We have no numerical data on the abundance of rodents in open areas of the Kampinoski Forest, but based on field observations and Buzzard clutch sizes in 1999 higher than the mean, it can be concluded that in the spring of that year their prey were readily available and abundant. The data on the density of rodents for a forest area were collected in western part of the Kampinoski National Park. In successive years 1998–2000 rodent densities did not vary, and only in the spring of 2000 they were lower because of a drought. And just in 1999 the number of nests with food surplus was three times as high as in the other years (Table 1). This provides evidence that surplus food occurs in Buzzard nests mainly where the local prey densities are high, and food supply can surpass the possibility of using it. Hunting for the surplus food in the periods of high rodent densities, bringing more prey items although some are already stored, and storing food of high (rodents) and low (amphibians) energy content together seem to imply surplus killing rather than food caching.

Table 1. Proportion of Buzzard nests with surplus food in Kampinoski National Park.

Years	1998	1999	2000
Total nests checked	14	23	11
Nests with no prey	4	4	3
Nests with 2 or more untouched prey items	2	9	1
Nests with 3 or more untouched prey items	1	6	1

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STRESZCZENIE

[Gromadzenie pokarmu czy nadmierne zabijanie u myszołowa?]

W czasie trzech sezonów lęgowych (1998–2000) na terenie Kampinoskiego Parku Narodowego skontrolowano 48 gniazd myszołowa — 27 znajdujących się w lesie i 21 zlokalizowanych na terenach otwartych lub na skraju lasu. W 12 gniazdach (4 w lesie i 8 na terenach otwartych) stwierdzono obecność 2 lub więcej nietkniętych ofiar (Tab. 1). Ponieważ najwięcej gniazd z dodatkową zdobyczą stwierdzono w 1999, kiedy zaobserwowano także wyraźnie większą liczbę składanych jaj (co może świadczyć o dostępności potencjalnych ofiar) można przypuszczać, że myszołowy w okresie karmienia piskląt nie gromadziły pokarmu, a raczej chwytały więcej zdobyczy niż były w stanie wykorzystać.