EXAMINATION OF FEEDING AND SOME POPULATION PARAMETERS OF ROE DEER (*CAPREOLUS CAPREOLUS, L.*) ON THE GREAT HUNGARIAN PLAIN

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ABSTRACT - Examination of feeding and some population parameters of roe deer (*Capreolus capreolus, L.*) on the Great Hungarian Plain
It is known that roe deer are concedered to be very choosy. It needs this sorting because the microorganisms, which help the digestion of high fibre plants, are missing in its stomack, that is why they are mostly called „concentrate selectors" (HOFFMANN,1985; 1988; 1989).
These animals should mostly eat easily digestable plants with high nutrition level (pulses, buds, sprouts and flowers). Consequently they are able to do this sorting because of their small mouth size. At winter there is a lack of these plants, so the high selectivity occurs only when the feed is in abundance.
Examining the amount and quality of vegetation available on the habitat of roe deer we can identify the species which can satisfy their feed demand. It is known, that roe deer as other large ruminants, in case of plant abundance prefer certain plants and plant parts while others avoided. The identification of the eaten species and the rate of their occurrence in the feed is the first step to become acquainted with the interaction between animal and the surroundings simultaneously.
Keywords: *roe deer, Capreolus capreolus, feed selection, food composition, body weight, kidney fat index*

INTRODUCTION

Gallery forest, wooded steppe and the scrubland are considered to be the ancient habitat of roe deer. They prefer leafy forests, forest edges and the bordering lawn or cultivated areas. On the enormous treeless plains they are not at all or only in limited numbers are found. The calmness offered by large scale field farming leading to area reservation of roe deer, this happened when they spread on the Great Hungarian Plain. This was also supported by the afforestation of the plain by forming forest belts and patches, namely the improvement of the habitat. The roe adapted to the agricultural environment very well. So in our days we separate the field and the forest roe ecotypes, which are different from each other in behaviour, social contacts and dietary habits (CSÁNYI, 1992).
Roe deer (*Capreolus capreolus, L.*) has the largest population within the big game population in Hungary. Their nourishment was examined in several countries of Europe, and the abundance of available nourishing plants was highly emphasized (MÁTRAI ET AL., 1986; FEHÉR ET AL., 1988). The key factor of food was not the quality but the accessibility. (TIXIER ÉS DUNCAN, 1996; DUNCAN ET AL., 1998; TIXIER ET AL., 1997; 1998).
During this examination we were keen to answer to what differences can be experienced between the composition of consumed food and the change in some population parameters. The plant combination consumed by roe deer is basically identified by the vegetation of the habitat. The quality of the natural vegetation seems to be the one of the most important factors which influences the density of the population, besides it determines the body- and

trophy weight and the reproductive performance. The autumn condition of the doe shows the quality of their habitat (MAJZINGER, 2004; 2007). During our examination have been looked for the answer to the underlisted questions:

1. What was the food combination consumed by roe in different hunting seasons on the examined territories?
2. How did the body weight, condition and trophy weight change by the examined roe on both territories?

MATERIAL AND METHOD

The sampling was from 01.10.2006 to 28.02.2009 on agricultural, on forest and floodplain habitats, because of the different ecological conditions of the two hunting areas. It has been assumed that the roe populations living there have different feeding strategies and population parameters.

The samples were taken from the hunting area Tiszaalpári Tisza Vadásztársaság (game management unit) (9500 hectares, where the woody vegetation consists of the floodplain forest, the forest cover of the area involved in the examination is more than 30%); the Bársony István Agricultural Secondary School of Csongrád (3010 hectares of special function hunting area, the forest cover is 20%); the Petőfi Vadásztársaság (game management unit) of Nagyszénás (7096 hectares, forest cover less than 1%) and the Szakszervezeti Vadásztársaság (game management unit) of Hódmezővásárhely (12727 hectares, forest cover less than 1%). The estimated roe population of the territories involved in the examination is 1800-2000 animals.

At the examined hunting season on the four different territories the data of 633 does was processed. The samples (N°: 211) were investigated in the laboratory of the University of Szeged Faculty of Agriculture where the processing of data was done continually.

To examine the feed of roe we used the shedded microfibre method (MÁTRAI ET AL., 1986). To identify the plants forming the feed we put a histological collection together from the photographed epidermis of the plants which can be found in the growing season on the area. The epidermis is the most resistant fibre containing part of the plant, the structure of which stays almost the same after digestion. The sampled plant parts should be damaged with nitric acid than dyed and fixed. According to the specific features we put an adverbial key together to simplify the identification of the species which constitute the feed. The definition of the feed combination was made according to the examination of unique samples.

During the examination we determined the body weight (BW) of the eviscerated doe, the kidneys and the adipose tissue around the kidneys, to characterize their condition via the kidney fat index (KFI) (CAUGHLEY ÉS SINCLAIR, 1994). To determine the age of dropped doe we examined the tooth abrasion and we have counted the cement zones of the M_1 subsequent molar. For calculating the differences among the characteristics (BW, KFI, age) and years on the areas – after exclusion of the protruding values and the homogenity examination – have been used single variable variance analysis, which was evaluated with the SPSS 14.0 program package.

RESULTS

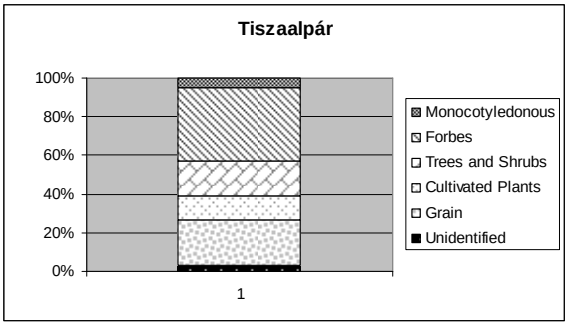

Figure 1. The feed composition of roe living on the territory of Tiszaalpári Tisza Vadásztársaság with high forest cover between 2006 and 2009 (n=48)

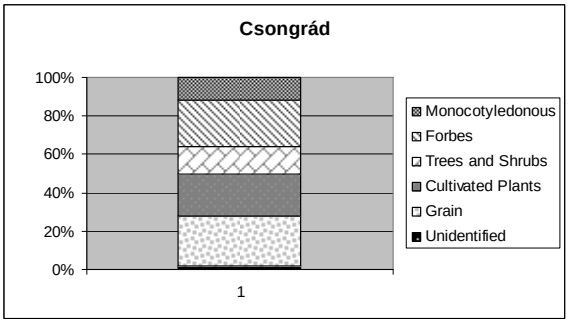

Figure 2. The feed composition of roe living on the territory of Bársony István Agricultural Seconary School of Csongrád on the field with forest cover between 2006 and 2009 (n=45)

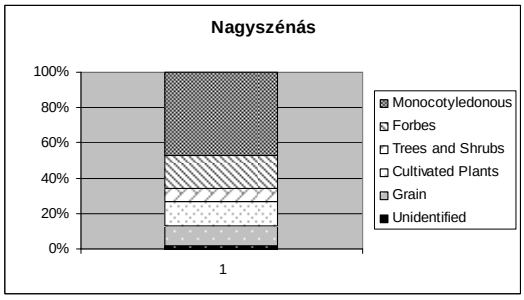

Figure 3. The feed composition of roe living on the territory of Petőfi Vadásztársaság of Nagyszénás on field habitat between 2006 and 2009 (n=62)

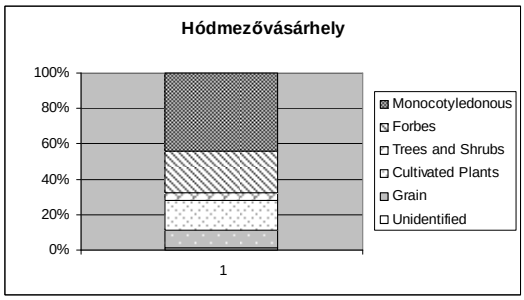

Figure 4. The feed composition of roe livin on the territory of the Szakszervezeti Vadásztársaság of Hódmezővásárhely on field habitat between 2006 and 2009 (n=52)

Table 1. The main statistical indicators of age, BW, KFI in Tiszaalpár

	2006			2007			2008		
	n	$\bar{x}$	S_x	n	$\bar{x}$	S_x	n	$\bar{x}$	S_x
Age	12	4,50	±2,06	15	4,53	±1,80	21	2,86	±1,65
BW	12	18,85	±1,54	15	19,56	±1,82	21	16,89	±2,42
KFI	12	0,50	±0,53	15	0,42	±0,28	21	0,62	±0,53

Table 2. The yearly significance of the examined variables on Tiszaalpár

	Age		BW		KFI	
	2007	**2008**	**2007**	**2008**	**2007**	**2008**
2006	0,962	0,016*	0,377	0,012*	0,670	0,473
2007	-	0,009*	-	0,000*	-	0,212

*: P < 0,05

On Tiszaalpár there was a significant difference (P<0,05) after comleting the significancy test between the BW of doe in year 2006 and 2008. After examining the KFI had been experienced the same result. Although there was no significant difference between the age of dropped doe in these years.

Table 3. The main statistical indicators of age, BW, KFI in Csongrád

	2006			2007			2008		
	n	$\bar{x}$	S_x	**n**	$\bar{x}$	S_x	**n**	$\bar{x}$	S_x
Age	14	4,71	±2,19	16	4,44	±2,06	15	4,53	±1,95
BW	14	15,08	±2,21	16	14,01	±3,48	15	12,55	±2,27
KFI	14	1,25	±0,55	16	1,03	±0,39	15	0,76	±0,28

Table 4. The yearly significance of the examined variables on Csongrád

	Age		BW		KFI	
	2007	**2008**	**2007**	**2008**	**2007**	**2008**
2006	0,717	0,815	0,294	0,018*	0,159	0,004*
2007	-	0,898	-	0,149	-	0,090

*: P < 0,05

In Csongrád there was a significant difference (P<0,05) after comleting the significancy test between the BW of doe in year 2006 and 2008. After examining the KFI had been experienced the same result. Although there was no significant difference between the age of dropped doe in these years.

Table 5. The main statistical indicators of age, BW, KFI in Nagyszénás

	2006			2007			2008		
	n	$\bar{x}$	S_x	**n**	$\bar{x}$	S_x	**n**	$\bar{x}$	S_x
Age	21	5,10	±2,14	16	3,44	±1,67	25	5,00	±1,75
BW	21	21,49	±1,40	16	20,52	±1,90	25	21,66	±1,00
KFI	21	2,04	±0,56	16	2,25	±0,81	25	2,10	±0,53

Table 6. The yearly significance of the examined variables on Nagyszénás

	Age		BW		KFI	
	2007	**2008**	**2007**	**2008**	**2007**	**2008**
2006	0,010*	0,864	0,043*	0,683	0,297	0,715
2007	-	0,012*	-	0,014*	-	0,456

*: P < 0,05

On Nagyszénás there was a significant difference (P<0,05) after completing the significancy test between the age of dropped doe in the year 2006 and 2007 and also in year 2007 and 2008. Examining the BW in year 2006 and 2007 and also year 2007 and 2008 ther was a significant difference (P<0,05) Although there was no significant difference between the KFI in these years.

Table 7. The main statistical indicators of age, BW, KFI in Hódmezővásárhely.

	2006			2007			2008		
	n (4)	$\bar{x}$	S_x	n	$\bar{x}$	S_x	n	$\bar{x}$	S_x
Age	20	4,25	±2,73	16	3,50	±1,89	20	4,20	±2,11
BW	20	19,19	±1,95	16	17,74	±1,75	20	19,32	±1,57
KFI	20	1,59	±0,59	16	1,29	±0,91	20	1,98	±0,98

Table 8. The yearly significance of the examined variables in Hódmezővásárhely.

	Age		BW		KFI	
	2007	2008	2007	2008	2007	2008
2006	0,336	0,946	0,018*	0,824	0,295	0,153
2007	-	0,369	-	0,010*	-	0,019*

*: P < 0,05

After examining the population parameters in Hódmezővásárhely accoring to the significancy test in year 2006 and 2007 and year 2007 and 2008 there was a significant difference (P<0,05), regarding the KFI there was a significant difference (P<0,05) in year 2007 and 2008.

CONCLUSIONS AND SUGGESTIONS

Experts in this field know very well, that game need feed and undisturbed lair. The game host who knows his territory well, knows the frequently visited and mostly liked places of roe. He also should know, which are those crucial plants which contribute to the qualitative improvement of the game stock (bigger trophy weight, good condition, high reproduction, healthy successors). Certain plant groups (monocotyledonous grasses) contribute to the satisfaction of feed claims of certain game races in an insignificant measure. There are other species which are sought for all the time, and there are others which are consumed only for a short period of time even if they are available all year long (MÁTRAI, 2000; 2006).

On the field, mostly on big broad areas with agricultural cultivation, in the examined year the dominant food components were of the cereals: the winter wheat, the autumn barley and corn, the consumption of dicotyledonous herbaceous plants were also considerable, primarily the alfalfa, red clover; the result were slightly different from those of HOLISOVA ET AL. (1982).We concluded that woody stem plants like the elderberry (*Sambucus nigra*), black locust (*Robinia pseudoacacia*) whip tree or the leaves and sprouts of willow were also consumed. On field habitat the examined population consumed in large quantities the cultivated plants, cereals and dicotyledonous plants (*figure 3 and 4*).

The combination of feed was more diverse in the examined period in Tiszaalpár and Csongrád on forest and floodplain habitat, the consumption of woody plants was present in a larger quantity. The dicotyledonous plants were also taken in large portions (mostly alfalfa (*Medicago sativa*), vetch (*Vicia sp.*), medical atrac (*Anchusa officinalis*), the cereals (winter wheat, autumn barley, other seeds and crops) the wooden stern plants (acacia, elder, blackberry and common pine) the results are similar to the results received on floodplain habitat by BARANCEKOVA (2004). The field population consumed cultivated plants, cereals and dicotyledonous plants in larger quantities (*figure 1 and 2*).
Generally have been concluded that as the forest cover decreases the consumption of wooden stem plants is reduced and the consumption of cereals is increased at the examined doe, and also they had smaller BW.

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