ARE EUROPEAN ROE DEER BROWSERS ? A REVIEW OF VARIATIONS IN THE COMPOSITION OF THEIR DIETS

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INTRODUCTION

Roe deer (*Capreolus capreolus*) are the most abundant cervids in Europe : they occur between 35-70° N from the Atlantic to the Urals (Gill, 1990), and with over 5 million individuals they are five times as abundant as red deer (*Cervus elaphus*).

Their importance as a game species (Gill, 1990, Table 7.2), as a constraint on commercial forestry, and as a component of forest ecosystems means that roe deer populations are usually managed. This has led to a considerable amount of research on their biology, and particular attention has been paid to their diets and their digestive system, which has led to this species being described as the « Type example of a concentrate selector » (Hofmann, 1989).

However there is no review of the information available from the large number of field studies on the diets of roe deer. This is clearly a necessary step towards drawing general conclusions on the feeding of the species, whether to define its feeding strategy and niche, to evaluate overlap with other species such as red deer, or to understand the impact of roe deer on natural and modified forest ecosystems.

The data from studies of the diets of roe deer are dispersed in a large number of scientific papers and unpublished reports and theses ; as part of an interdisciplinary study of the feeding and nutrition of roe deer, we review here the available information in order to :

— identify the main sources of variation in diets (e.g. season, habitat, altitude, latitude) ; and

— define the feeding niche of roe deer by determining the importance for them of the principal items typically eaten by small ungulates : woody browse, forbs, grass, seeds, fruit and fungi.

METHODS

THE DIFFERENT METHODS USED FOR DIET STUDIES OF ROE DEER

Stomach content analysis was the method most commonly used in the studies reviewed. It suffers from two principal problems, different passage rates of

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different components and the impossibility of recognising some small fragments (cf. Gaare *et al.*, 1977 ; Holechek *et al.*, 1982).

Though the extent of the resulting bias has not been studied in roe deer, the studies of Drodz (1979), Oleffe *et al.* (1993) and Blanchard *et al.* (1993) show that the digestibilities of natural food species of roe deer can vary considerably in the same season (e.g. from 37 % for hornbeam to 93 % for oilseed rape) ; further, the stomachs of shot roe deer have variable degrees of fill (e.g. 0.15-1.9 kg fresh weight, Holisova *et al.*, 1982), so the bias could be considerable. In one study stomach contents showing a relatively high degree of digestion were not analysed (Maizeret, 1983), but no such selection was adopted by other workers.

The samples were sieved in all studies, which could cause the under-representation of the less fibrous components such as fruits. Different mesh sizes (1-5 mm) were used, so this bias may be of varying importance ; where there was a choice we have used the results from the finest mesh size. Studies with > 25 % unidentified material were not retained in this review.

Stomach content analysis therefore provides data which are to some extent biased against the least fibrous fractions, and different degrees of bias may occur in different studies. However in other ruminants this method provides results which are reasonably accurate (Holechek *et al.*, 1982), and we expect that the same is true of roe deer.

Faecal analysis was the second most commonly used method, with ten studies. As for other ruminants (Holechek *et al.*, 1982 ; Putman, 1984), in roe deer the species composition of the fragments in faecal samples differs considerably from stomach samples (Maizeret *et al.*, 1986 ; Holisova *et al.*, 1986 ; Degrez & Libois, 1991). We have therefore preferred not to include the results from faecal analysis in this review.

Aldous' method of **browse inventory** can provide useful data for studies which focus on woody plants (Kossak, 1976 ; Cannac, 1978 ; Boisaubert, 1982 ; Boisaubert *et al.*, 1985 ; Denis,1988), but since it does not allow inclusion of categories such as fruits and seeds, or forbs, we have not included the results of studies which use this method in this review.

We review here 24 studies from a wide range of habitats between 39-60° N and 4-25° W and 0-1 400 m altitude, (Table I). Since the different authors did not use the same categories to describe the diets of the animals they studied we have classified all the results into a unique set of categories (Table II), which are necessarily broader than the ones used in the original papers. Unfortunately in only one of the studies (Holisova *et al.*, 1982) was woody browse divided into the nutritionally different tissues, leaves, petioles and twigs. These have therefore been lumped as 'woody browse'. We have been able to separate this taxonomically into the major groups of trees (deciduous and coniferous), shrubs, heather (*Calluna*), Brambles, Ivy and bilberries. Forbs were divided into wild and cultivated species (e.g. alfalfa, peas, etc.).

SOURCES OF VARIATION

As in other species there are considerable variations between the contents of the stomachs of different individuals (Maizeret, 1983 ; Navarre, 1993). Within one season at a single site in Hungarian farmland, the stomach of one roe had 93 % maize, another 0 % (Matrai *et al.*, 1983). These differences may arise from

TABLE I

The geographical locations of the studies based on stomach content analysis

Habitat	Reference		Site		Vegetation	Coordinates		Altitude (m)
Farmland	Biran	1989	Picardy	France	Farmland	49°54N	2°18E	< 350
	Kaluzinski	1982	Czempin	Poland	Farmland	58°08N	16°45E	< 350
	Holisova	1982	Moravia	Czechoslovakia	Farmland	48°57N	16°29E	< 350
	Matrai	1983		Hungary	Farmland	47°N	20°E	< 350
Coniferous woodland	Cederlund	1980	Grimso	Sweden	Conifers	59°60N	15-16°E	< 350
	Siuda	1969	Pitz forest	Pologne	Conifers	52°43N	21°36E	< 350
	Gebczynska	1980	Bialowieza	Pologne	Conifers	52°38N	24°E	< 350
	Matrai	1983		Hungary	Conifers	47°N	20°E	< 350
	Henry	1978	Hamsterley	United Kingdom	Conifers	54°41N	1°50W	< 350
	Fandos	1987	Sierra Guadarrama	Spain	Conifer-Oak	47°00N	4°W	1 089
Woodland/farmland	Navarre	1993	Ibos	France	Oak-Chestnut-Farmland	43°14N	0°05W	< 350
	Petersen	1992	Kalo	Denmark	Beech-Conifer-Farmland	58°18N	10°30E	< 350
	Petersen	1992	Borris	Denmark	Conifer-Willow-Farmland	55°58N	8°30E	
	Maizeret	1983	Landes	France	Conifer-Farmland	44°N	0°20W	< 350
Deciduous Woodland	Fichant	1979	Lorraine	Belgium	Oak-beech	49°41N	5°49E	400
	Maizeret	1991	Chizé	France	Oak-beech	46°10N	0°20W	< 350
	Maillard	1989	Haye	France	Oak-beech	48°42N	6°12E	< 350
	Maillard	1984	Haye	France	Oak-beech	48°42N	6°12E	< 350
	Maillard	1987	Haye	France	Oak-beech	48°42N	6°12E	< 350
	Maizeret	1989	Chizé	France	Oak-beech	46°10N	0°20W	< 350
	Grigorov	1976	Gabrovo	Bulgaria	Beech	42°52N	25°19E	< 350
	Jackson	1980	Hampshire	United Kingdom		51°06N	1°19W	< 350
	Birkenstock	1989	Vosges	France	Oak-beech-conifer	48°12N	7°20E	720
	Fandos	1987	Sierra Demanda	Spain	Oak-beech	42°N	2°40W	1 400
	Fandos	1987	Toledo	Spain	Oak	39°N	4°30W	< 350

TABLE II

Analysis of variance of the proportions of dietary components in the stomach contents of roe deer in the different habitats (Farmland, Conifer, Deciduous and mixed Woodland/farmland) and the four seasons.

	MODEL			HABITAT			SEASON		
	F	d.f.	P	F	d.f.	P	F	d.f.	P
Seeds + fruits	4.7	15,50	< 0.001	12.8	3,50	< 0.001			ns
Cultivated forbs	6.0	15,50	< 0.001	19.2	3,50	< 0.001			ns
Wild forbs	3.1	15,50	0.001	3.1	3,50	0.034	7.4	3,50	< 0.001
Graminoids	2.8	15,50	0.002	4.5	3,50	0.007	4.2	3,50	0.011
Conifers	2.8	15,50	0.003	2.9	3,50	0.043	5.8	3,50	0.002
Heather	2.2	15,50	0.020	7.4	3,50	< 0.001			ns
Bilbery	3.1	15,50	0.002	12.1	3,50	< 0.001			ns
Brambles	2.2	15,50	0.020	5.5	3,50	0.002			ns
Trees + Shrubs			ns			ns			ns
Ivy, fungi, dead leaves, other + unidentified			ns			ns			ns

variations between meals, or between individuals ; stomach content analysis can obviously not be used to study these effects. In view of the magnitude of these variations, sample sizes should ideally be large : in the studies reviewed here, they varied from 5-299 (median = 74) ; they were smallest in spring and summer.

Variations due to **gender** are suspected : in a northern conifer forest in winter males ate more conifers (22 %) than females (< 1 %, Grigorov, 1976) ; in Czechoslovakian farmland females ate a more varied diet, with less mushrooms and more fruit and seeds than males (Holisova *et al.*, 1982) ; and in deciduous forests females ate more Brambles and mushrooms (Maillard, 1984).

There may be an effect of **age :** in an oak-beech woodland roe deer in their first year ate more wood than adults, especially females (Maillard, 1984). In Czechoslovakian farmland, Holisova *et al.* (1984) observed that first year males ate less fruits and seeds than older males. Maizeret (1983) on the other hand noted no important differences between the stomach contents of females and their own young. These differences were not tested statistically, and in view of the fact that they were not consistent between studies it is unlikely that there are important effects of sex and age on the diets. The information on the ages and sexes was not always available in the results of the field studies, so we have not balanced the samples for the numbers of individuals in the different age and sex classes.

An important source of variation is the differences between years in the **availability** of preferred foods : in a deciduous woodland acorns rose from 4 % to 89 % of the diet in two successive autumns (Maillard *et al.*, 1984, see also Navarre, 1993). The availability of the different dietary components was measured in only one study (Holisova *et al.*, 1982), so it was not possible to evaluate the importance of this factor here ; nonetheless the studies reviewed are likely to be representative of the species' diet since all but three covered more than one year, and the set covered all but four of the years 1963-92.

The main determinant of the availability of different food items (e.g. acorns) is the **habitat.** Roe occur generally in woodlands and farmlands but the studies

reviewed include sites in temperate oak-beech woodlands, continental and Scandinavian conifer forests, and Mediterranean maquis with a variable amount of farmland. On the basis of the descriptions provided by the authors, the sites were classified into four broad habitat types : farmland, mixed woodland/farmland, coniferous woodland and deciduous woodland.

Another important source of variation in the diets of roe in some studies was the **season ;** the data are therefore analysed seasonally, using the definitions of the authors. In order to test for effects of **altitude** we included this variable with two categories (lowland, highland), and **latitude** with three categories (Scandinavian, continental, or Mediterranean).

The results of the literature review suggest, unexpectedly, that roe are highly selective for seeds, in particular acorns. We tested the hypothesis that even in summer, when vegetative parts of plants of high quality are abundant, roe deer prefer acorns. We used two groups of captive animals living in large enclosures on natural food supplemented by goat pellets (CAPRIVAL®). The experiments were done in summer, and the animals were offered simultaneously acorns and leaves of palatable plants (*Acer, Carpinus, Quercus* for group 1, seven females ; *Carpinus* for group 2, a male and three females). The weights eaten were recorded, for the whole of group 1 : and for the individual animals in group 2. One deer attempted to eat acorns, but was unable to chew them and gave up perhaps because of dental problems : the results from this animal were discarded. Trials were done on different days and were stopped when one of the foods was nearly finished.

STATISTICAL ANALYSIS

As a first step we used correspondence analysis (Hill, 1974) to identify visually the main sources of variation in the data set (habitat, season, altitude, latitude). We then used analyses of variance on arcsine transformed percentages to test whether the groups detected differed in statistically significant ways. All analyses were done using SAS (SAS Institute, 1988).

RESULTS

In the studies reviewed here, roe deer were found to eat a very wide range of foods, including 305 taxa of fungi and plants, mosses, lichens, and all the major orders of angiosperms (a complete list is available on request). Vegetative parts of higher plants (leaves and twigs), seeds and fruits dominated the diets ; flowers, caryopses and roots of wild plants were also eaten but were not recorded as representing an important part of the stomach samples in a given site and season, except by Holisova *et al.* (1984), who recorded up to 9 %. Flowers of lucerne comprised up to 11 % and roots of sugar beet 20 % in this study. Though animal hairs were found in some samples, meat or bones of animals were never reported as a significant part of the diet ; we conclude that carnivory by roe is rare, perhaps non-existent.

The diets, divided into 13 components which were consistent between studies, were submitted to a correspondence analysis for the full data set of 66 sites × seasons (Fig. 1). The first two axes account together for 38 % of the variance : Axis 1 opposes seeds + fruits and cultivated dicots to heather, while Axis 2 opposes dicots to ivy and brambles (Fig. 1a). The other axes were not biologically

interpretable, and are not considered further. Axes 1 & 2 separate the sites from the three major **habitats,** farmland, conifer woodlands and deciduous woodlands, with mixed farmlands/woodlands intermediate. The sites from similar **altitudes** and **latitudes** had very variable diets (e.g. for the Mediterranean, in the Sierra

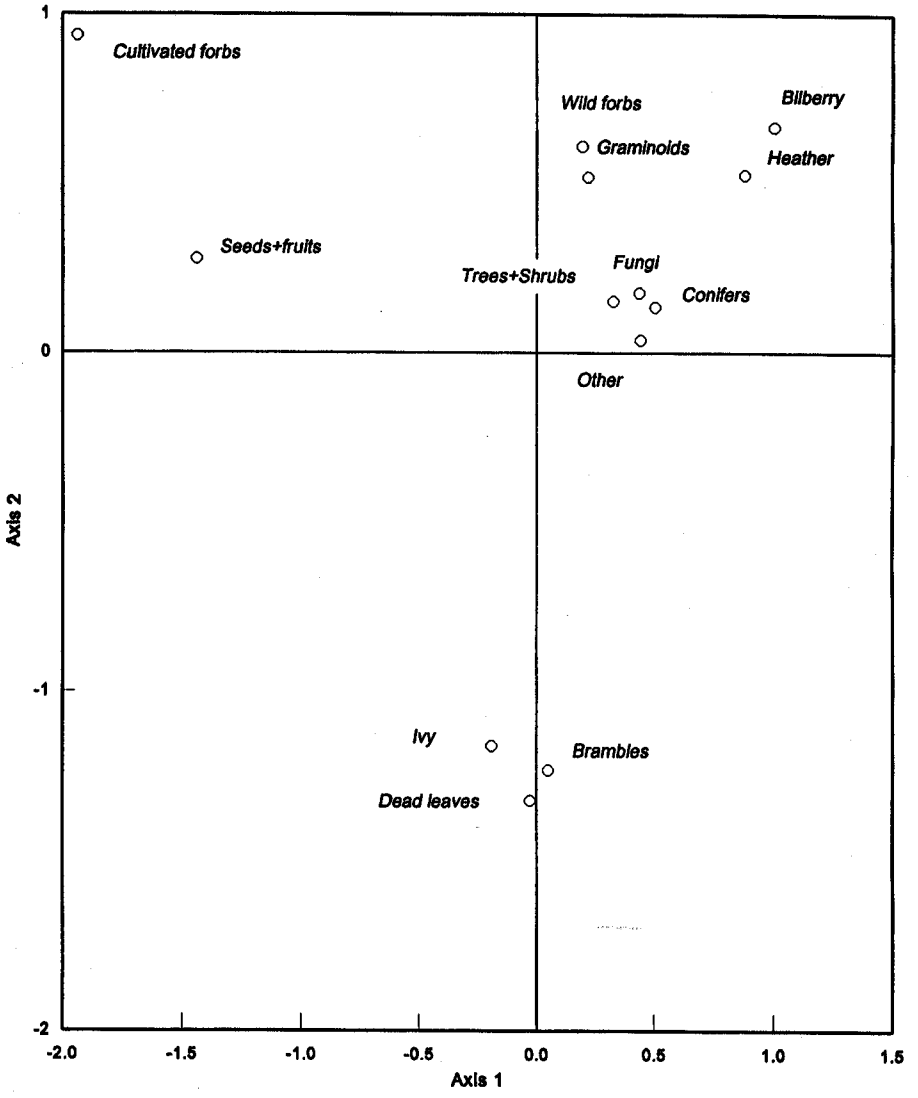
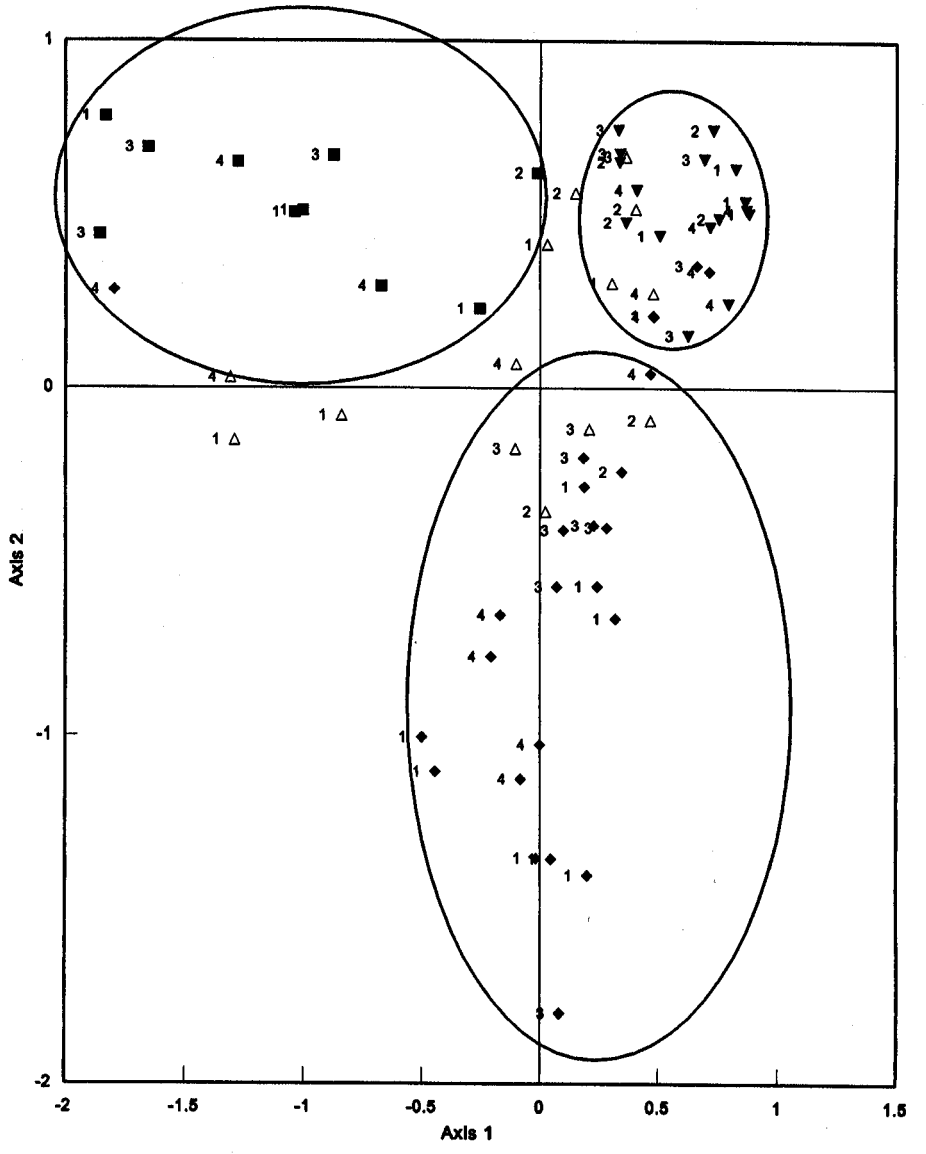


Figure 1. — Correspondence analysis of the results of stomach content analysis on material from roe deer in Europe.

a. Ordination of the dietary components.



b. Ordination of the sites × seasons.
1-4 = the seasons, Winter-Autumn
black squares = Farmland
black triangles = Coniferous woodland
blacks diamonds = Deciduous woodland
open triangles = Mixed Farmland/woodland

TABLE III

The average proportions of the dietary components in roe deer stomach contents from the main habitats, by season. The sources are those listed in Table II.

Habitat	Number of studies	Season	Seeds and fruits	Cultivated forbs	Wild forbs	Graminoids	Conifers	Heather	Bilberry	Trees and shrubs	Brambles	Ivy	Fungi	Dead leaves	Other and uniden-tified
Farmland	4	winter	41.66	11.78	14.25	16.00	2.08	0.00	0.00	8.62	2.08	3.77	0.18	0.00	0.06
	1	sping	12.80	2.10	29.20	27.80	2.00	0.00	0.00	23.50	0.00	0.00	0.00	0.00	2.80
	3	summer	60.35	11.60	18.69	2.58	0.00	0.00	0.00	4.75	0.54	0.00	0.00	0.00	1.66
	2	autumn	27.09	22.12	5.53	7.95	0.45	0.00	0.00	27.80	6.02	1.06	2.13	0.00	0.01
Conifer woodlands	5	winter	2.09	0.00	10.14	8.58	28.10	16.47	9.71	13.87	6.18	0.06	0.95	0.60	1.86
	4	spring	0.00	0.00	29.68	13.40	4.20	8.93	7.88	23.61	1.35	0.00	3.55	0.00	3.63
	4	summer	1.41	0.00	42.31	7.69	6.73	10.20	7.64	11.71	5.51	0.08	2.76	0.00	1.59
	4	autumn	0.00	0.00	17.04	5.12	3.80	18.34	11.94	21.25	5.63	0.00	5.16	0.00	7.47
Woodland and farmland	4	winter	34.74	0.03	6.72	6.32	10.93	2.45	0.01	18.46	5.17	7.26	0.76	0.08	6.90
	4	spring	5.62	0.00	20.63	9.89	11.46	1.64	0.33	29.81	9.76	3.93	0.96	0.00	6.82
	3	summer	7.50	0.05	33.56	1.42	0.01	2.03	0.00	26.72	11.65	5.53	1.16	0.00	10.35
	3	autumn	30.84	0.40	4.64	1.94	0.82	5.70	0.00	29.02	8.37	2.88	7.46	0.05	8.63
Deciduous woodlands	9	winter	3.21	0.00	1.31	1.72	10.37	1.25	0.06	13.94	39.07	19.13	1.19	2.53	4.96
	1	spring	0.00	0.00	18.40	8.40	1.60	2.80	4.80	28.60	28.40	6.20	0.60	0.01	5.21
	7	summer	2.73	0.00	10.49	1.83	0.66	0.31	3.81	31.41	29.99	10.13	1.66	0.27	6.40
	8	autumn	16.75	0.00	1.73	0.48	2.07	4.39	0.80	32.48	15.54	14.20	2.27	1.38	7.63

Guadarrama, brambles represented > 95 %, but only 12 % in the Toledo study) ; in the ordination these sites are spread between the deciduous and conifer woodland groups.

There are four exceptions to the otherwise clear separation between farmland, coniferous and deciduous woodland diets : the most extreme is the deciduous woodland point 4 in the extreme left of the farmland points ; it represents data from an autumn when the oak trees had produced abundant acorns, and the roe switched from browsing to granivory (Maillard *et al.*, 1984). There was a tendency for the data from the winter **season** to have positive values on Axis 1 (associated with trees + shrubs, heather and conifers) and negative values on Axis 2 (associated with ivy).

We used a two-way ANOVA to test the statistical significance of the differences between these (four) habitats and (four) seasons. None of the interactions were significant ($P > 0.05$) ; but the differences between the seasons were significant for dicots, graminoids and conifers (Table II) with dicots and graminoids eaten most in summer, and conifers in winter (Table III). We have therefore maintained the separation of the data on a seasonal basis.

The major differences between the three main habitats and the mixed farmland/woodland (the contribution of fruits + seeds, wild forbs and trees + shrubs) were also statistically significant (Table II). In the farmlands the diets were dominated by seeds + fruits (60 % in summer) and/or cultivated forbs, with trees and shrubs in spring and autumn (Table III).

In both types of woodlands woody browse from brambles as well as trees and shrubs dominated the diets in all seasons (Table III) but the species on which the animals feed change completely between habitats. In the coniferous woodlands, the principal plants in winter were conifers and heather, in the warm seasons forbs and browse from trees + shrubs. In deciduous woodlands in all seasons woody browse and brambles were the principal dietary components, with ivy in the winter ; and acorns in autumn in some years. Seeds in general, and acorns in particular, are more difficult to locate than leaves for a human observer : this result suggested that the roe were selecting strongly for these seeds : we tested this by offering captive roe deer fresh leaves and acorns. The first group preferred acorns (Table IV) ; and the individuals of the second group showed the same trend, though the result was not significant for one of them, whose behaviour showed strong day-to-day variations.

DISCUSSION

The results of the studies reviewed here confirm that roe deer feed on a very wide range of foods. The principal dietary categories vary considerably between the three main habitat types in which the animals are found, deciduous and conifer woodlands, and farmlands. The animals therefore show great flexibility in their feeding behaviour, and can switch diets between seasons and habitats. The results of these studies suggest that roe prefer not to be browsers when the abundance of seeds and fruits allows them to obtain enough of these foods. Since the method used, stomach content analysis, underestimates the contribution of the more digestible components (i.e. seeds + fruits) in the diets, the conclusion that roe deer prefer to be granivorous or frugivorous is certainly robust. This is supported by the

TABLE IV

Consumption of acorns (Quercus *seeds) and leaves of palatable trees when presented simultaneously to two groups of roe deer (mean fresh weight consumed for the whole groupe 1, dry weight for individual in group 2). n is the number of trials.*

Animals	Acorn		Leaf		t	P
	Mean weight	Standard error	Mean weight	Standard error		
Group 1 (7 females) n = 8	33.2	4.9	4.4	1.8	5.4	0.001
Group 2 (3 females, 1 male)						
F 1 n = 8	61.3	5.4	7.0	1.8	9.9	0.001
F 2 n = 7	42.4	19.7	5.2	2.2	1.8	0.124
M n = 8	50.8	17.2	2.1	1.8	2.7	0.031

preference experiment which showed that roe eat acorns in preference to fresh foliage of palatable plants. In view of the possibility of acidosis on seed-based diets, it would be useful to know more about how roe deer mix, on a 24-hour basis, foliage and seeds when these are equally available, and, further, how long they can remain granivorous without suffering from the clinical symptoms which are unfortunately so common in captive roe deer (Markholdt, 1991).

Roe are therefore concentrate feeders with a feeding niche very close to that of the commonest ungulates of comparable size in the woodlands and shrublands of other continents. In tropical Africa these are duikers of the genus *Cephalophus* and *Hyemoschus* (Gautier-Hion *et al.,* 1980), and the Bush duiker (*Sylvicapra grimmia,* Skinner & Smithers, 1990). The diet of the duikers is dominated by fruit + seeds and leaves of trees and shrubs and graminoids are used to only a very small extent. Though animal matter is found in only very small amounts in the stomach samples (< 1 %) it is used by a large proportion of individuals (33-86 %), unlike in roe deer. The forest duikers eat mainly ants, perhaps accidentally, but the Bush duiker has been noted to eat carrion and to « attack small rodents and birds up to the size of an egret » (Kingdon, 1982). It is possible that roe deer are more carnivorous than is suggested by this review : they may eat animal matter for short periods in particular habitats, or the animal matter eaten could be digested very rapidly, however the data currently available indicates that it is very unlikely that animal matter is an important source of food for this species. In temperate North America white-tailed and mule deer (*Odocoileus*), though they are generally browsers, like roe deer feed extensively on seeds such as acorns when these are available (e.g. Massey *et al.,* 1994).

These relatively small concentrate selectors weigh < 70 kg (adult females), and occupy a niche which is clearly different from that of the mixed-feeding ruminants such as red deer/wapiti and the tropical impala, whose diets are always dominated by the vegetative parts of plants (Jarman & Sinclair, 1979 ; Kay & Staines, 1981). Among the ungulates with which European roe deer are sympatric

their niche is quite close to that of the similarly-sized non-ruminant omnivore, the wild boar (*Sus scrofa*). Seeds and fruits are important components of the diets of both species (cf. Dardaillon, 1987), and the importance of the vegetative parts of plants increases markedly through winter and spring. The major difference is, of course, that roe do not eat animal matter. Why roe differ in this respect from wild boar and the African Bush duiker, another ruminant, is unclear.

There is little known about the extent to which roe deer are selective. In view of the fact that most plant material in deciduous woodlands is made up of the woody parts of plants, it is intuitively obvious that they select for the most digestible plant parts. Holisova *et al.* (1982) sampled farmland roe between September and December, and separated the plant material into leaves, buds, twigs, flowers, caryopses, seeds and fruits. They found that only 7.7 % of the stomach contents were composed of twigs.

Roe are also known to feed selectively with respect to plant species. In a study of tame animals in four different habitats, timber stand, thicket, plantation and wooded fallow land, Kossak (1983) showed that the animals used at least 63 % of the 155 species available. Of these, a minority (6-12 % depending on the habitat) were preferred, 34-69 % avoided, and the remainder eaten as available. Most of the diet was made up of plants of the last type, which suggests that roe fed rather unselectively for plant species. How generally valid this result is must await further field data.

This review suggests that when roe are restricted to woodland, this is because they are constrained from using more open habitats, where forbs are more abundant. In many European countries in the first half of the 20th century, this was probably because of disturbance by man. The recent expansion of roe into farmlands in many countries has been linked to a reduction in shooting pressure (Gill, 1990), and it has allowed the 'field roe' to use more forbs, and seeds of cultivated plants, which are nutritionally superior to the foods of woodland roe.

This change should have demographic consequences : we predict that rates of fawn survival and the fertility of young females are higher in farmland habitats. Rates of fertility and survival of prime-age roe deer will probably not be different since they are so high and show little variations (98 % of females > 2 years breed, Gaillard *et al.*, 1992 ; and adult survival rates are around 85 % per year for males and 95 % for females, Gaillard *et al.*, 1993). If these predictions are correct, then the improved diet, and its effects on the demography of roe deer may well be one of the mechanisms behind the great increase in the population sizes of European roe deer in the last half century.

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SUMMARY

We review the results of field studies of the diets of roe deer in order to discover the principal sources of variations in the diet, and to provide a basis for defining the principal food resources of the species. The methods used, stomach content analysis, faecal analysis and inventories of browsing, have different biases : we use here the results from stomach content analysis. The use of wild forbs, graminoids and conifers varied significantly between seasons. There were major differences between diets in farmland, coniferous and deciduous woodlands in the contribution of fruits + seeds, cultivated and wild forbs and trees + shrubs.

The farmland diets were dominated by fruits + seeds and/or forbs, with woody browse in spring and autumn. In the coniferous woodlands, the principal plants in winter were conifers and heather, in the warm seasons forbs and deciduous browse. In deciduous woodlands in all seasons woody browse and brambles were the principal components, with ivy in the winter and acorns in autumn in some years.

Roe deer are apparently granivorous or frugivorous when seeds and fruits are sufficiently abundant, becoming browsers when their preferred foods are rare. When living in farmlands the feeding niche of European roe deer shows some similarities to that of wild boar (*Sus scrofa*) : both take considerable amounts of fruits and seeds, and increase the use of vegetative parts of plants in winter. In other continents this niche is occupied by other ungulates of similar body size, deer of the genus *Odocoileus* in North America and duikers of the tribe *Cephalophini* in Africa.

RÉSUMÉ

Nous présentons ici une synthèse des résultats des travaux de terrain sur le régime alimentaire du Chevreuil, avec l'objectif de comprendre les causes majeures de variation, et de définir les ressources alimentaires principales de l'espèce. Les méthodes utilisées pour étudier son régime, analyse de contenus stomacaux, analyse de féces et inventaires d'abroutissement, présentent différents biais ; dans cette revue bibliographique nous utilisons les résultats issus de l'analyse des contenus stomacaux. L'utilisation des herbacées naturelles, des graminées et des conifères varie significativement entre les saisons. Il y a des différences importantes dans la contribution des fruits + graines, herbacées naturelles et cultivées, arbres et arbustes entre les trois types d'habitats pour lesquels des données sont disponibles (plaines cultivées, forêts de feuillus, forêts de conifères).

Dans les plaines agricoles, le régime alimentaire est dominé par les fruits + graines et/ou herbacées, avec des ligneux au printemps et en automne. Dans les forêts de conifères les plantes principales sont, en hiver, les résineux et la bruyère ; en été, les herbacées et ligneux. Dans les forêts feuillues, ronce et ligneux dominent quelle que soit la saison, avec le lierre en hiver et, certaines années en automne, les glands.

Ces résultats suggèrent que le Chevreuil est granivore ou frugivore lorsque les graines et les fruits sont suffisamment abondants ; et, qu'il devient brouteur quand cette nourriture préférée est rare. La niche alimentaire du chevreuil de plaine

présente certaines similarités avec celle du sanglier (*Sus scrofa*). Les deux espèces utilisent beaucoup les fruits et les graines et augmentent leur consommation de la partie végétative des plantes en hiver.

Sur d'autres continents, d'autres ongulés de taille similaire occupent la même niche, comme les cerfs du genre *Odocoileus* en Amérique du Nord et les petites antilopes de la tribu des *Cephalophini* en Afrique.

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