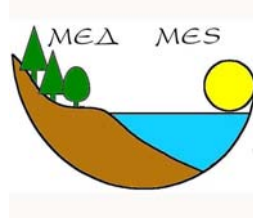


Macedonian Ecological Society

Institute of Biology, Faculty of Natural Sciences and Mathematics
1000 Skopje, Macedonia



Food Availability for Vultures (*Aegypiinae*) in Macedonia - natural sources and livestock breeding -



Compiled by

Metodija Veleviski

With contributions of:

Prof. Dr. Ljupčo Melovski, Prof. Dr. Vladimir Maletik,
Prof. Dr. Vladimir Dzabirski and Slavcho Hristovski

The preparation of this study was supported by the grant of Frankfurt Zoological Society and the help of Black Vulture Conservation Foundation.

Skopje, May 2003

INTRODUCTION

The reduction of the food resources for vultures is one of the main reasons for their decline. Significant decrease of the wild ungulates number as a result of habitat degradation and direct anthropogenic pressure and abandonment of traditional farming and live-stock breeding practices posed severe problems for the carnivores on the highest levels of the trophic pyramid in the ecosystems.

This study deals with the overall number and distribution of wild animals - potential food source for vultures as well as the present condition of the live-stock breeding in Macedonia, number and distribution of domestic animals, historical trends and their use in food industry.

NATURAL FOOD SOURCES

Deer (*Cervus elaphus* L.)

This species was formerly widespread in the larger parts of hilly and mountainous landscapes in Macedonia. The most important site was Kožuf Mt. (S Macedonia), where was the last place it could be found in the wild. There are many reasons for its disappearance, but the most important is the lack of active protection.

In 1980, in some regions, first attempts for its reintroduction were made. Most important localities where it was reintroduced were the hunting reserves "Jasen" and "Kadina Reka" near Skopje, and the National Parks "Mavrovo" and "Pelister". In the beginning, all specimens were kept in fenced area, but since recently, few individuals are released on regular base.

The total surface where it can be found today is only ca. 30000 ha (only in the mentioned regions), and the population (both free and captive) is estimated on 300 individuals.

Released individuals are subject to intensive poaching, but estimation of rate of killing does not exist.

This species, due to its low number and limited distribution, as well as control of the population, is not important potential food source for the carnivores, thus for the vultures also.

Roe Deer (*Capreolus capreolus* L.)

This is the most widespread ungulate in Macedonia; it can be found in all major forests in the country, on total surface of ca. 900000 ha. Its most important populations can be found at Osogovo Mt, Maleševski Mt., Plačkovica Mt. Ogražden Mt, Belasica Mt. (all in E Macedonia), Kožuf Mt., Nidže Mt., Baba (Pelister) Mt., Ilinska Mt and Plakenska Mt (in S Macedonia), then Jakupica Massif in Central Macedonia, Skopska Crna Gora Mt and Šar Planina Mt. in northern Macedonia and Bistra, Korab, Dešat, Galičica, Jablanica, Karaorman and Stogovo in W Macedonia, but also on nearly all smaller mountains.

It is permanently protected species (Act on Hunting), but it is under strongest pressure from poaching. Present Macedonian population is estimated on 5000 individuals, number considered to be few times smaller from the true potential.

Mortality rate is significant, especially due to poaching. Of approximately 3800 lambs, 2000 die of various reasons. Additionally, 500-1000 adults are subject to poaching every year.

The average weight of the Roe Deer (young animals included) is ca. 10 kg.

Chamois (*Rupicapra rupicapra* L.)

The most important populations can be found in the National Park "Mavrovo" and the hunting reserve "Jasen". Its areal goes over Krčin Mt, Korab and Šar Planina Mt., and isolated populations can be found on Stogovo, Jablanica, Galičica, Baba (Pelister), Kožuf and Jakupica.

It is estimated that the entire Macedonian population counts 2000 individuals; however, according to some other estimations, 1500 individuals live on the Korab Mt. only.

Due to its life, this is potentially most important species for natural food of vultures. It is also not subject of intensive poaching (ca. 100 individuals are killed annually). Natural mortality rate of lambs is high; 500 out of 800 die annually.

The average weight of the Chamois (young animals included) is ca. 15 kg.

Wild Boar (*Sus scrofa* L.)

The Wild Boar can be found on almost entire territory of Macedonia. Expansion of its living areas has also been noted. Significant part of its population is within fences, especially at forest reserve "Jasen" (Jakupica Massif) and "Milisin" (on Kožuf Mt.).

As a result of the high hunting pressure in one, and natural high rate of reproduction in other hand, large changes in the number of its population take place, and on average population is estimated between 2000 and 3000 individuals.

Natural mortality is not as high as in the case of other species; but approximately 2000 out of 5000 pigs die due to natural causes. Additionally, ca. 1500 pigs are killed every year, and 1000 more adults (Official statistics says on average only 750 annually in the period 1995-1999). It is estimated that ca. 500 individuals are wounded during the hunt, but manage to escape from hunters.

The average weight of the Wild Boar (young animals included) is only ca. 20-25 kg.

Hare (*Lepus europaeus* L.)

Widespread on the whole territory of Macedonia; no estimations on its population exist. Suffers great hunting pressure (according to the official data, ca. 17000 individuals were killed in 1995 and 1996, but the true number is probably twice that big.

This number drastically decreased in the following years: 1466 individuals in 1997, 957 in 1998 and 6605 in 1999. Reasons for such decline are not known).

Tortoises (*Testudo hermanni/graeca*)

There are no estimations on number of tortoises in Macedonia; although not considered threatened, significant export exists. Other main threats are forest fires.

LIVESTOCK BREEDING

Data used for livestock breeding in Macedonia mostly originate from the official Annuals of the Department for Statistics. Although not always complete and complementary, they still present clear picture for the development/stagnation of livestock breeding in Macedonia. Most often available data were regarding the whole territory of Macedonia, except data from the census in 1994, where overview by municipalities is given, but only for private holdings, and data from the Statistical Annual 2002, where data for municipalities are available only for state holdings.

Data from the last Census of people and holdings are going to be available after November 2003, and the State Department for Statistics is planning extensive census for agricultural holdings in late 2003. These data will probably be available one year later. Problems occur due to the new division of the territory of Macedonia on municipalities, that took place in 1996. The municipalities (e.g. Bitola) in 1994 were divided at smaller ones after 1996. Therefore, two different maps are part of this study (Fig. 1 and 2).

All numbers in the text regard the total number of animals; exact figures for the animal belonging to different age and sex groups are presented in the appropriate tables.

What is given as "Skopje region" refers to total surface of five municipalities according to 1994 Census and seven after the new territorial division from 1996.

Cattle and buffaloes

According to the last official data (Statistical Annual 2002), there were 265267 heads of cattle on the whole territory of Macedonia. From these, only 10836 were state property, and there are data for their spatial distribution - most of them (3884) were kept in the farms in municipality of Bitola, then in municipality of Gazi Baba (Skopje region - 1234), and 896 were kept in the farms in the municipality of Sveti Nikole. Municipalities of Kavadarci (781), Bogdanci (near Gevgelija - 764), Strumica (759) and Petrovec (near Skopje - 678 heads) follow. Rest of municipalities hold less than 400 heads (detailed information in Table 1).

There are no data for the distribution of cattle from the private holdings. However, the Census from 1994 gives useful information. Again, it is municipality of Bitola with highest number of heads (9743), then Prilep (9481), Kumanovo (9384), Kičevo (9309), Struga (8900) etc. (detailed information in Table 2).

The distribution of cattle in state and private holdings is presented on Fig. 3 and 4.

There were only 605 buffaloes remaining in Macedonia in 2001, and there is no information for the regions where they can be found. However, at least part of them are kept in Pelagonija Plain.

Historical overview gives interesting information - the highest number (408877) was found in 1949. From the more recent date, the highest number (391341) was found in 1981. Average number was ca. 320000. Also interesting is that the number of adult oxen has dramatically decreased - from 137325 in 1958 to only 1410 in 2001, which is of course in connection with abandonment of traditional farming practices. Number of adult cows increased, from 111979 (in 1957) and 101091 (in 1965) to 174255 in 2001. Number of young calves, bullocks and heifers also increased. These increases are in connection to increased need for fresh milk and meat used in human diet. Number of buffaloes decreased from 20247 in 1957 to only 605 in 2001. Extensive data are given in Table 3.

Interesting data for movement of figures of slaughtered and died animals can be obtained from Table 4 (bought and sold animals are excluded from the table). It is obvious that the average percentage of slaughtered animals rose from ca. 5% (period 1958-1968) to ca. 18% (period 1995-2001). In the same time, the average percentage of died animal remains nearly the same - ca 3 % and ca 2,5 %, respectively. However, in absolute values, number of died animals declined from maximum of 16000 in 1958, to minimum of 4000 in 1995 and 9000 in 2001.

Largest number of cattle which is potential prey of carnivores goes to the native race "Buša" (33 % of the total number of cattle), due to the traditional practice of grazing (animals stay on the pastures almost continuously). Average losses in the flocks are 3-5 %. It is estimated that 2 % of the loses might be potential food source for the vultures.

Average rendered weight of cattle in slaughterhouses is ca. 50 % (Table 5).

Horses and donkeys

Number of horses in Macedonia is lower then the number of Cattle, and is currently moving at ca. 45638. Of those, only 258 are state property (Table 6), with "highest" numbers concentrated in Rostuše, Kavadarci and Gostivar (68, 55 and 51 respectively). Of the total number of horses kept in private holdings (45380 in 2001 and 40313 in 1994), majority can be found in municipalities (according to the old territory division used in the Census 1994, Table 7): Strumica (7334), Tetovo (5069), Skopje region (3746), Gostivar (2772) and Prilep (2501). Other regions hold less than 2000 heads.

Total number of Donkeys and hybrids with horses (hinnies and mules) in 1994 for the whole territory of Macedonia was 31682. Highest numbers were found in region of Skopje (2045), municipalities Strumica (2031) and Radoviš, Prilep, Kumalovo, Delčevo and Bitola, from ca. 1400 to ca. 1650.

Historically, number of horses in Macedonia declined approximately twice, from 82338 in 1949 to 45656 in 2001 (Table 8).

The distribution of horses in private holdings is presented on Fig. 5.

Goats

Formerly prohibited for keeping as domestic animals due to "damage they were causing to the forests", now, after withdrawal of the ban, are again in slow expansion. However, there are not much official data. According to the Statistical annual 2002, there are 81553 goats in Macedonia, only 116 of which are state property, nearly all kept in farm in Kratovo (Table 9). According to the census in 1994, the total number of goats in Macedonia was 97617 heads. Highest number (11252) was found in the municipality of Strumica, then Skopje region (7253), Radoviš (5867), Kočani (5350) etc. (Table 10). It is obvious that majority of goats are concentrated in E Macedonia.

There are no data for the historical trends.

The distribution of goats in private holdings is presented on Fig. 6.

Pigs

According to the Statistical Annual 2002, from the 189293 pigs, 80652 were state property, and 108641 were held in private holdings. As far pigs in state farms are concerned, most of them are concentrated in municipalities of Kumanovo (17321), then Gradsko (south of Veles, 13533), Karbinici (Štip region) 13050) and Sveti Nikole (9209) (Table 11). According to the 1994 Census, highest numbers of pigs in private holdings are concentrated in municipalities: Kumanovo (12757), Strumica (9694), Skopje region (8821) and Kočani (8818) (Table 12).

As far data of slaughtering and mortality rate are concerned (Table 13), in the period 1958-1968 the total number of slaughtered pigs was on average equal with the number of live animals (ca. 100000, large numbers were imported), then decreased to approximately 90 %, but actually the absolute number increased to on average 140000 heads in the period 1978-1990, and presently (period 1995-2001) is 70 % (with fluctuations in numbers from 105000 to 170000). Rate of mortality is significant (varying from 24-30 % in different periods, with numbers from 25000-70000, and 30000-79000 for the period 1995-2001).

Historically, pigs are the only group of domestic animals which number increased in the period 1957-2001. The lowest number was in 1967 (84650), and the highest in 1999 (226047). They had second maximum in 1982 (210335) (Table 14).

Average rendered weight of pigs in slaughterhouses is ca. 65 % (Table 15).

The distribution of pigs in state and private holdings is given in Fig. 7 and 8.

Sheep

Sheep are considered to be the most important domestic animals in Macedonia in one, and the most favorable food source for vultures in other side, especially due to the extensive way of farming which included transhumance.

According to the Statistical Annual 2002, today there are 1285100 sheep in Macedonia, 89740 of which are state property (Table 16). Of these, largest number (17487) are registered in the municipality Mavrovi Anovi (north-western Macedonia, Bistra Mt., Mavrovo National Park), and 11168 in the municipality of Štip. Follow

municipalities of Rostuše (NW Macedonia, Stogovo Mt) with 9609, Gostivar (7016), Bogdanci (near Gevgelija, 6600) and Veles (5214).

According to the 1994 Census (Table 17), largest numbers in private property were held in municipalities: Prilep (61589), Bitola (52854), Kumanovo (43989), Veles (36026), Tetovo (32439), Berovo (E Macedonia, 31166) and Skopje Region (36436, most of which in municipalities Kisela Voda and Gazi Baba - 13108 and 10642).

Historically, number of sheep has significantly decreased, from 2387943 in 1947 to 1285009 in 2001 (Table 18), and nearly 50 % for the last few years. Furthermore, the number of slaughtered sheep and lambs also decreased (on average 10 % of the total number in the period 1958-1968, or 200000 heads, through 6 % for the period 1978-1990 - on average 135000, to 6 %, but on average 80000 animals for the period 1995-2001), as well as the mortality rate (from ca. 10 % for the period 1958-1968, to 4% (ca. 60000 animals) for the period 1995-2001.) (Table 19).

The distribution of sheep in state and private holdings is presented on Fig. 9 and 10. The presented figures of exiting sheep is given according to the summer pastures, thus do not reflect the real distribution of sheep, especially in the calculations of food availability (Tab. 25 and 26).

There are some other characteristics for the sheep breeding in Macedonia that need to be mentioned. Although the highest number of sheep is in private property, the individual house holdings are small, with 20-200, rarely more than 500 sheep per holding. Most present is the native race "Pramenka", of which 60 % goes to Ovče Pole sub-race and 30 % to Šar Planina Mt. sub-race. Their biological characteristics are: total weight of 32-35 kg, fertility 100-110 %, total weight of new-born lambs of 2-4 kg, total weight of 90 days old lambs of 15-18 kg.

There is one breeding season (January-February), and lambs are dependent on milk until March-April. Mortality rate is on average 3-5 % at adult sheep, and 5-12 % at lambs, highest before they are rejected of lactation. Until that moment, lambs reach 13-15 kg.

Former transhumance practice used to take place along relatively long routes (60-250 km), with duration of 20 days in spring and 30-40 in autumn. The average number of sheep that were moving was 200000.

It is estimated that ca. 1 % of died animals can be consumed by carnivores or vultures.

Average rendered weight of sheep in slaughterhouses is ca. 45 % (Table 20).

Since there are no available data on exact quantities of offal that is produced by slaughterhouses per year, we tried to estimate these figures using data we had for total number of animals, average percentage of died and slaughtered animals in the period 1995-2001, average weight of animals and average percent of rendered weight in slaughter houses. We assumed that 1 % of died animals and 1 % of the offal in slaughtered houses should be available for vultures. Only in the case of cattle (cows) we assumed that 2 % of the died animals are potentially available for vultures. However, in the region of Sveti Nikole, Veles, Negotino and Štip, probably more than 30 % of the

offal of the slaughterhouses is available for vultures. Thus, the figures presented on Tab. 21-26, are only approximate.

From these figures, we can conclude that available food can support larger number of vultures than the present one. Largest amount of potential food comes from cows (110.1 t/yr) then pigs (96.8 t/yr) and sheep (19.4 t/yr). Total potentially available food (226.3 t/yr only from cows, pigs and sheep) was estimated on the basis of the figures from number of animals given in the Statistical Annual 2001. According to some unofficial data, the quantities of available food are up to four times higher (consultancy with experts from Department of Livestock breeding, Faculty of Agriculture - Skopje).

In the case of sheep, the distribution of available food by municipalities presented on Tab. 21-26 is not reflecting the real situation. It is result of migration from summer to winter pastures.

Table 1. Number of cattle in state holdings (2001)

Municipality	Calves under 3 months old	Heifers from 1 month to 1 year	Heifers from 1 to 2 years	Heifers over 2 years	Heifers in calf	Cows	Bulls for stud	Total Cattle
Gazi Baba	61	246	135	146	138	357	151	1234
[uto Orizari		5						5
Ba~		18				50	2	70
Bel~i{ta	6	6			3	16	1	32
Berovo		8			1	10		19
Bistrica	3	1	6			30		40
Bitola	552	349	1161	21	121	1680		3884
Bogdanci	98	106	49	41	100	370		764
Bogovinje	5	3	2		1	5	3	19
Vinica		3				21	2	26
Vitoli{te		39				195	95	329
Del~evo	9		30	35		9	64	147
Kavadarci	109	112	143		55	362		781
Ki~evo	14				12	29	2	57
Krivoga{tani	7	11	13	9	8	66		114
Negotino	17	53			29	126	1	226
Petrovec	55	130	87	32		374		678
Peh~evo		15	19	1	8	40		83
Prilep						14		14
Radovi{	72	108	17		21	142	3	363
Sveti Nikole		263	223		52	356	2	896
Struga	2	5			3	16	1	27
Strumica	103	138	136			382		759
Tetovo	6	24	6	5	12	75	1	129
Topol~ani	21		12	18		70		121
Capari		1				18		19
State property MK	1140	1644	2039	308	564	4813	328	10836
Private property MK	23042	40931	10285	4475		168878	6810	254421
TOTAL MK	24182	42575	12324	4783	564	173691	7138	265257

Table 2. Number of cattle in private holdings (Census 1994)

Municipality	Calves and heifers	cows and heifers in calf	Oxen, bulls and other grown up cattle	Total
Skopje	4162	8156	689	13007
Gazi Baba	1014	2765	126	3905
Karpos	1296	2068	187	3551
Kisela Voda	1211	2227	216	3654
Centar	57	67	33	157
Cair	584	1029	127	1740
Berovo	1105	2121	138	3364
Bitola	3643	5705	395	9743
Brod	1261	1563	188	3012
Valandovo	616	919	48	1583
Vinica	308	583	291	1182
Gevgelija	1115	1865	78	3058
Gostivar	6052	7850	568	14470
Debar	681	836	170	1687
Delcevo	1615	2445	664	4724
Demir Hisar	1067	1324	71	2462
Kavadarci	201	289	95	585
Kicevo	4081	4733	495	9309
Kocani	1042	2296	479	3817
Kratovo	608	1162	162	1932
Kriva Palanka	1998	3394	284	5676
Krusevo	919	1445	66	2430
Kumanovo	2209	6244	931	9384
Negotino	242	585	60	887
Ohrid	1810	2424	113	4347
Prilep	3756	5135	598	9489
Probistip	539	809	86	1434
Radovis	868	1501	224	2593
Resen	1798	1907	144	3849
Sveti Nikole	363	666	108	1137
Struga	4086	4697	117	8900
Strumica	2674	5324	567	8565
Tetovo	11246	15569	1316	28131
Veles	1514	2252	333	4099
Stip	576	928	217	1721
Republic of Macedonia	62155	94727	9695	166577

Table 3. Historical movements in the number of cattle and buffaloes

	Calves under 3 months old	Bullocks and heifers from 3 months to 2 years old	Bullocks and heifers over 2 years old	Cows and heifers in calf	Bulls for stud	Oxen	Total Cattle	Buffaloes	Total Cattle and Buffaloes
1949									408877
1950									387085
1951									376308
1952									393126
1953									388153
1954									38723
1957				111979		136999	351280	20247	371527
1958	82939			120232	8988	137325	349484		349484
1959	57642	28333	22546	113728	2341	132757	357347		357347
1960	50616	31774	21329	113700	2687	127287	347393	18919	366312
1961	59268	24141	17788	115123	1539	118570	336429	15530	351959
1962	58595	28000	18600	113880	2016	117294	338385	15530	353915
1963	49792	26862	20306	110031	3111	114286	324388	17470	341858
1964	42071	23273	18232	101168	2543	110001	297288	15663	312951
1965	48150	18520	15861	101091	4663	101499	289784	17366	307150
1966	54597	23953	19143	105392	3762	105251	312098	12645	324743
1967	53237	26222	19082	108863	4094	107241	318739	13631	332370
1968	56807	24778	20025	114162	3573	106424	325769		325769
1974	62889	23756	13376	130039	3521	99958	333539	9825	343364
1975	69204	24678	15409	133885	4320	99772	347268	10316	357584
1976	69897	27029	17382	140979	3329	98936	357552	9768	367320
1977	82494	23783	14786	143134	3592	97330	365119	11100	376219
1978	89875	23884	14975	144694	4442	91494	369364	9426	378790
1979	100462	26045	16055	154245	4794	87760	389361	9343	398704
1980	97533	26965	13854	154219	4144	85205	381920	9006	390926
1981	108100	29853	16880	156496	3486	76526	391341	9200	400541
1982	104356	30103	16639	148846	5722	65673	371339	9020	380359
1983	108386	22458	9179	142654	3772	46728	333177	7800	340977
1984	80444	22348	12941	137791	3832	44307	301663	6750	308413
1985	73155	18644	10494	137394	2682	30344	272713	3308	276021
1986	71248	18855	8630	140311	2925	21540	263509	2316	265825
1987	21844	83530	7003	153980	2736	18044	287137	1780	288917
1988	21976	63867	25170	157263	3463	18783	290522	1709	292231
1989	17953	81064	7768	158442	3677	18726	287630	1647	289277
1990	28203	68436	6704	144237	2833	14761	265174	1602	266776
1994	21826	73347	6309	165813	2577	11464	281336	1021	282357
1995	19724	76441	8718	166374	3299	8681	283237	1017	284254
1996	27518	77009	5638	175621	5747	3080	294613	1013	295626
1997	26580	72488	4440	177383	5564	2973	289428	908	290336
1998	24897	64609	3925	166553	4987	2488	267459	899	268358
1999	21362	63914	5474	171969	5415	2013	270147	725	270872
2000	22448	57510	6899	171745	4892	1474	264968	632	265600
2001	24182	54899	4792	174255	5728	1410	265266	605	265871

Table 4. Number and percentage of slaughtered and died cattle

		At a beginning of a year	Slaughtered		Died		At the end of a year	
		No	No	%	No	%	No	%
	1958	373000	14000	3.75%	16000	4.29%	376000	100.80%
	1959	376000	14000	3.72%	14000	3.72%	366000	97.34%
	1960	366000	11000	3.01%	11000	3.01%	352000	96.17%
	1961	352000	12000	3.41%	10000	2.84%	356000	101.14%
	1962	356000	19000	5.34%	11000	3.09%	341000	95.79%
	1963	324000	17000	5.25%	12000	3.70%	297000	91.67%
	1964	297000	11000	3.70%	9000	3.03%	290000	97.64%
	1965	290000	17000	5.86%	9000	3.10%	312000	107.59%
	1966	312000	19000	6.09%	9000	2.88%	319000	102.24%
	1967	319000	18000	5.64%	10000	3.13%	322000	100.94%
	1968	322000	19000	5.90%	9000	2.80%	320000	99.38%
<i>Average %</i>				4.70%		3.24%		99.15%
	1978	370000	30000	8.11%	9000	2.43%	390000	105.41%
	1979	390000	33000	8.46%	8000	2.05%	382000	97.95%
	1980	382000	34000	8.90%	7000	1.83%	392000	102.62%
	1981	392000	70000	17.86%	9000	2.30%	371000	94.64%
	1982	371000	67000	18.06%	8000	2.16%	334000	90.03%
	1983	334000	35000	10.48%	8000	2.40%	302000	90.42%
	1984	302000	35000	11.59%	7000	2.32%	286000	94.70%
	1985	286000	36000	12.59%	5000	1.75%	273000	95.45%
	1986	273000	37000	13.55%	6000	2.20%	264000	96.70%
	1987	264000	41000	15.53%	7000	2.65%	287000	108.71%
	1988	287000	41000	14.29%	5000	1.74%	291000	101.39%
	1989	291000	33000	11.34%	5000	1.72%	288000	98.97%
	1990	288000	34000	11.81%	4000	1.39%	287000	99.65%
<i>Average %</i>				12.50%		2.07%		98.20%
	1995	281000	54000	19.22%	4000	1.42%	283000	100.71%
	1996	283000	55000	19.43%	8000	2.83%	195000	68.90%
	1997	295000	57000	19.32%	6000	2.03%	289000	97.97%
	1998	289000	42000	14.53%	7000	2.42%	267000	92.39%
	1999	267000	54000	20.22%	5000	1.87%	270000	101.12%
	2000	270000	45000	16.67%	9000	3.33%	265000	98.15%
	2001	265000	37000	13.96%	9000	3.40%	265000	100.00%
<i>Average %</i>				17.62%		2.47%		94.18%

Table 5. Slaughtered cattle: number, weight and use

Cattle	Year	calves under 6 months	heifers over 6 months	coew and other	total
Total livestock slaughtered	1995	8000	74000	9000	91000
	1996	7000	56000	8000	71000
	1997	8000	59000	9000	76000
	1998	7000	50000	7000	64000
	1999	8000	53000	9000	70000
Slaughtered in slaughterhouses	1995	2000	14000	2000	18000
	1996	3000	11000	2000	16000
	1997	1000	8000	2000	11000
	1998	4000	5000	3000	12000
	1999	4000	1000	0	5000
Average gross weight of livestock slaughtered in slaughterhouses in kg	1995	147	345	498	340
	1996	145	335	438	312
	1997	131	327	373	317
	1998	140	318	413	282
	1999	160	325	543	193
Rendered weight of livestock slaughtered in slaughterhouses in percents	1995	51	51	49	50.3
	1996	54	51	49	51.3
	1997	51	50	46	49
	1998	51	50	45	48.7
	1999	50	50	53	51

Table 6. Number of horses in state holdings (2001)

Municipality	Foals	Mares and filies in foal	Stallions and horses for work	Total horses
Gazi Baba		1	1	2
Gostivar	10	14	27	51
Gradsko	9	11	1	21
Kavadarci	24	29	2	55
Ki{evo	1	1	1	3
Kru{evo			1	1
Mavrovi Anovi	10	12	23	45
Rostu{e	14	17	37	68
Sveti Nikole			2	2
[tip	2	5	3	10
State property MK	70	90	98	258
Private property MK	1076	7854	36450	45380
TOTAL MK	1146	7944	36548	45638

Table 7. Number of horses in private holdings (Census 1994)

Municipality	Mares and filies in total	Total horses	Donkeys, hinnies and mules	Total horses & donkeys
Skopje	630	3746	2045	5791
Gazi Baba	156	632	322	954
Karpos	66	585	599	1184
Kisela Voda	331	1639	831	2470
Centar	2	29	12	41
Cair	75	861	281	1142
Berovo	417	1330	752	2082
Bitola	404	1260	1424	2684
Brod	118	362	805	1167
Valandovo	103	313	832	1145
Vinica	63	217	1413	1630
Gevgelija	254	945	1249	2194
Gostivar	343	2772	732	3504
Debar	156	684	238	922
Delcevo	164	446	1654	2100
Demir Hisar	200	927	598	1525
Kavadarci	206	730	965	1695
Kicevo	116	1269	812	2081
Kocani	313	952	1664	2616
Kratovo	135	310	836	1146
Kriva Palanka	274	974	829	1803
Krusevo	190	805	368	1173
Kumanovo	407	1988	1543	3531
Negotino	211	458	689	1147
Ohrid	125	474	700	1174
Prilep	794	2501	1641	4142
Probistip	36	121	896	1017
Radovis	522	1966	1681	3647
Resen	7	50	375	425
Sveti Nikole	111	326	509	835
Struga	116	837	579	1416
Strumica	2196	7334	2031	9365
Tetovo	457	5069	1378	6447
Veles	224	868	1744	2612
Stip	134	279	700	979
Republic of Macedonia	9426	40313	31682	71995

Table 8. Historical movements in the number of horses

	Colts and fillies	Mares and fillies in total	Stallions and geldings	Total
1949				82338
1950				81048
1951				77963
1952				77962
1953				78159
1954				81621
1957		21628		82147
1958	13185	31445	41907	73352
1959	18743	31777	39406	71183
1960	18663	32157	40187	72344
1961	17346	28466	43213	71679
1962	12957	29028	50696	79724
1963	11781	30399	49150	79549
1964	8360	29713	50830	80543
1965	12426	29766	46078	75844
1966	9643	30939	51732	82671
1967	8671	31035	52996	84031
1968	7898	30657	55908	86565
1974	5606	28993	55580	84573
1975	5879	29508	56107	85615
1976	6392	28610	57766	86376
1977	7333	28479	59541	88020
1978	6261	28203	62115	90318
1979	7480	27208	64173	91381
1980	5758	23574	66118	89692
1981	6073	25657	63095	88752
1982	4313	19093	66782	85875
1983	5080	26344	50245	76589
1984	5591	22515	52843	75358
1985	4215	16519	56273	72792
1986	2585	16473	51399	67872
1987	3635	14405	51674	66079
1988	2133	14153	51775	65928
1989	2049	13637	50079	63716
1990	1941	14874	49467	64341
1994	2220	13353	46224	61797
1995	2240	15338	44155	61733
1996	4838	15139	46502	66479
1997	4691	14535	46643	65869
1998	4542	15595	39710	59847
1999	1685	10214	45253	57152
2000	2097	13312	41077	56486
2001	1164	7944	36548	45656

Table 9. Number of goats in state holdings (2001)

Municipality	Goats
Zajas	6
Kratovo	110
State property MK	116
Private property MK	81437
TOTAL MK	81553

Table 10. Number of goats in private holdings (Census 1994)

Municipality	Goats
Skopje	7253
Gazi Baba	2367
Karpos	1091
Kisela Voda	2753
Centar	41
Cair	1001
Berovo	2430
Bitola	2521
Brod	1628
Valandovo	1670
Vinica	4965
Gevgelija	2865
Gostivar	2591
Debar	1313
Delcevo	4991
Demir Hisar	1547
Kavadarci	2717
Kicevo	2181
Kocani	5350
Kratovo	2723
Kriva Palanka	2739
Krusevo	447
Kumanovo	2996
Negotino	3300
Ohrid	3093
Prilep	4229
Probistip	1911
Radovis	5867
Resen	927
Sveti Nikole	1677
Struga	1128
Strumica	11252
Tetovo	3468
Veles	3764
Stip	4074
Republic of Macedonia	97617

Table 11. Number of pigs in state holdings (2001)

Municipality	Piglets under 2 monts	Piglets from 2 to 6 months	First farrow sows	Sows	Boars	Other	Total
Gazi Baba	82	67		41	4	63	257
Karpo{	43	183	6	20	3		255
[uto Orizari	8	21		11	1		41
Berovo	908	4647	327	530	27		6439
Bitola	1847	2496	43	443	22	27	4878
Brvenica	1480	2120	105	502	25		4232
Valandovo	240	100		100	3		443
Vasilevo	114	68	4	35	3	1	225
Vinica	727	4004	160	461	10		5362
Gevgelija	130	300	41	12	4		487
Gradsko	1861	9987	309	1346	30		13533
Del~evo	1590	1689	125	363	17		3784
Zajas	272	299	8	62	12		653
Zrnovci	20	15	10	5			50
Karbinci	4028	7345	265	1383	29		13050
Kratovo				3			3
Krivoga{tani		8	7	4	1		20
Kumanovo	8689	6412	362	1804	54		17321
Peh~evo	52	20		10	1		83
Prilep	68	21	13	25	2	43	172
Sveti Nikole	1113	7050	210	817	19		9209
Tetovo	44	32	12	19	1	5	113
[tip	27	5		8	2		42
State property MK	23343	46889	2007	8004	270	139	80652
Private property MK	38010	45220		16530	1688	7193	108641
TOTAL MK	61353	92109	2007	24534	1958	7332	189293

Table 12. Number of pigs in private holdings (Census 1994)

Municipality	Suckling pigs and piglets	Sows and first farrow sows	Boars and other grown up pigs	Total
Skopje	4778	1622	2421	8821
Gazi Baba	2766	1036	1520	5322
Karpos	463	182	270	915
Kisela Voda	1108	235	393	1736
Centar	24	6	7	37
Cair	417	163	231	811
Berovo	1851	628	665	3144
Bitola	3692	693	320	4705
Brod	660	135	183	978
Valandovo	997	307	216	1520
Vinica	1316	487	644	2447
Gevgelija	1413	271	258	1942
Gostivar	318	79	146	543
Debar	0	0	0	0
Delcevo	3298	1680	1509	6487
Demir Hisar	1197	144	314	1655
Kavadarci	1107	200	507	1814
Kicevo	917	154	111	1182
Kocani	4931	1905	1982	8818
Kratovo	1136	687	441	2264
Kriva Palanka	3020	1196	775	4991
Krusevo	328	58	58	444
Kumanovo	6850	3017	2890	12757
Negotino	907	498	352	1757
Ohrid	4073	378	813	5264
Prilep	2965	512	618	4095
Probistip	1614	442	573	2629
Radovis	1840	514	717	3071
Resen	826	156	59	1041
Sveti Nikole	1221	580	640	2441
Struga	2274	716	225	3215
Strumica	6669	1551	1474	9694
Tetovo	4258	1282	1390	6930
Veles	681	177	374	1232
Stip	1140	321	322	1783
Republic of Macedonia	66277	20390	20997	107664

Table 13. Number and percentage of slaughtered and died pigs

Pigs		At a beginning of a year	Slaughtered		Died		At the end of a year	
		No	No	%	No	%	No	%
	1958	110000	113000	102.73%	25000	22.73%	141000	128.18%
	1959	141000	139000	98.58%	31000	21.99%	136000	96.45%
	1960	136000	118000	86.76%	32000	23.53%	125000	91.91%
	1961	125000	111000	88.80%	25000	20.00%	106000	84.80%
	1962	106000	103000	97.17%	24000	22.64%	93000	87.74%
	1963	93000	98000	105.38%	21000	22.58%	109000	117.20%
	1964	109000	108000	99.08%	23000	21.10%	122000	111.93%
	1965	122000	127000	104.10%	27000	22.13%	101000	82.79%
	1966	101000	107000	105.94%	29000	28.71%	85000	84.16%
	1967	85000	104000	122.35%	25000	29.41%	100000	117.65%
	1968	100000	103000	103.00%	27000	27.00%	97000	97.00%
<i>Average %</i>				101.26%		23.80%		99.98%
	1978	167000	174000	104.19%	64000	38.32%	170000	101.80%
	1979	170000	155000	91.18%	57000	33.53%	168000	98.82%
	1980	168000	155000	92.26%	60000	35.71%	192000	114.29%
	1981	192000	147000	76.56%	72000	37.50%	210000	109.38%
	1982	210000	146000	69.52%	73000	34.76%	193000	91.90%
	1983	193000	146000	75.65%	88000	45.60%	197000	102.07%
	1984	197000	155000	78.68%	88000	44.67%	202000	102.54%
	1985	202000	147000	72.77%	65000	32.18%	148000	73.27%
	1986	148000	137000	92.57%	48000	32.43%	161000	108.78%
	1987	161000	140000	86.96%	68000	42.24%	187000	116.15%
	1988	187000	131000	70.05%	62000	33.16%	157000	83.96%
	1989	157000	140000	89.17%	45000	28.66%	161000	102.55%
	1990	161000	130000	80.75%	50000	31.06%	179000	111.18%
<i>Average %</i>				91.82%		30.22%		100.66%
	1995	171000	140000	81.87%	60000	35.09%	175000	102.34%
	1996	175000	170000	97.14%	79000	45.14%	192000	109.71%
	1997	192000	156000	81.25%	30000	15.63%	184000	95.83%
	1998	184000	107000	58.15%	30000	16.30%	197000	107.07%
	1999	197000	119000	60.41%	70000	35.53%	226000	114.72%
	2000	226000	128000	56.64%	58000	25.66%	204000	90.27%
	2001	204000	105000	51.47%	60000	29.41%	189000	92.65%
<i>Average %</i>				69.56%		28.97%		101.80%

Table 14. Historical movements in the number of pigs

	Porkers under 2 months	Pigs from 2-6 months old	Sows and first farrow sows	Boars for stud	Pigs being fattened	Total
1949						118715
1950						124670
1951						131615
1952						145883
1953						129195
1954						104010
1957			20980			97207
1958	66256		24738	3728	14431	109153
1959	76501	28154	21553	2392	12143	140743
1960	69995	30301	20253	2481	13238	136268
1961	71000	20408	19015	2149	11811	124383
1962	61500	15921	16656	3156	8915	106148
1963	54540	15846	12900	2045	8071	93402
1964	67272	18282	13766	1919	7808	109047
1965	71266	21141	17922	2042	9149	121520
1966	55476	18347	16214	2549	8349	100935
1967	45370	17277	13485	1652	6866	84650
1968	61274	18071	14239	808	5207	99599
1974	78039	22906	19969	1913	9858	132685
1975	87937	28149	20058	2052	9691	147887
1976	83386	20552	20876	1977	11918	138709
1977	101149	21047	24743	2263	16653	165855
1978	95211	23576	25923	2410	20293	167413
1979	94403	26198	25794	2636	21396	170427
1980	96613	19817	25861	2258	23229	167778
1981	118325	18198	29190	2013	24563	192289
1982	125133	22977	29310	2385	30530	210335
1983	119523	20541	26981	1243	24309	192597
1984	124918	18238	26794	1588	25008	196546
1985	85571	15788	19054	1694	25645	147752
1986	84980	17742	20875	2383	35435	161415
1987	52182	89695	26159	2540	16109	186685
1988	39147	74454	21716	1835	19681	156833
1989	35593	78959	23795	2220	20640	161207
1990	44574	83615	22584	1594	26168	178535
1994	31354	84991	29288	3474	22464	171571
1995	38485	88030	29420	1971	17157	175063
1996	45228	92697	28546	2485	23440	192396
1997	46225	83785	32948	2543	18792	184293
1998	54773	89825	30834	1854	19553	196839
1999	56309	115062	32674	2440	19562	226047
2000	54584	107986	29247	1882	10436	204135
2001	61353	92109	26541	1958	7332	189293

Table 15. Slaughtered pigs: number, weight and use

	Year	pork	infirm	pigs for pork	fattened	total
Total livestock slaughtered	1995	32000	28000	90000	44000	194000
	1996	35000	36000	106000	47000	224000
	1997	35000	37000	90000	43000	205000
	1998	34000	36000	88000	43000	201000
	1999	37000	38000	95000	46000	216000
Slaughtered in slaughterhouses	1995	1000	6000	44000	1000	52000
	1996	1000	5000	46000	2000	54000
	1997	1000	10000	27000	1000	39000
	1998	1000	10000	30000	3000	44000
	1999	1000	2000	33000	1000	37000
Average gross weight of livestock slaughtered in slaughterhouses in kg	1995	17	65	110	196	106
	1996	17	67	101	174	101
	1997	15	65	93	185	88
	1998	16	64	94	209	95
	1999	17	73	95	180	96
Rendered weight of livestock slaughtered in slaughterhouses in percents	1995	71	59	70	64	66
	1996	64	62	70	61	64.25
	1997	65	58	65	66	63.5
	1998	68	57	68	74	66.75
	1999	58	63	69	67	64.25

Table 16. Number of sheep in state holdings (2001)

Municipality	Lambs	Ewes	Rams and sterile ewes	Total sheep
Gazi Baba	894	667	11	1572
Bitola	868	2345	125	3338
Blatec	365	420	13	798
Bogdanci	1200	5250	150	6600
Veles	2550	2508	156	5214
Vitoli{te	80	2113	2000	4193
Gevgelija	80	955	28	1063
Gostivar	959	5771	286	7016
Gradsko	244	3318	221	3783
Zajas	18		4	22
Kavadarci		3357	413	3770
Karbinci		304	6	310
Ki~evo		1200	68	1268
Ko~ani	652	1412	46	2110
Kratovo	410	837	30	1277
Kru{evo	204	824	68	1096
Mavrovi Anovi	975	15212	1300	17487
Negotino		2015		2015
Peh~evo	697	1563	65	2325
Probi{tip	1045	760	65	1870
Radovi{	84			84
Rostu{e	1400	6202	2007	9609
Sveti Nikole	20	545	40	605
Strumica		534	123	657
Topol~ani	72	400	15	487
[tip	1441	9195	532	11168
State property MK	14258	67707	7772	89737
Private property MK	303169	829062	63131	1195362
TOTAL MK	317427	896769	70903	1285099

Table 17. Number of sheep in private holdings (Census 1994)

Municipality	Lambs and yearlings	ewes for breeding	Rams and other grown up sheep	Total
Skopje	5445	24278	6623	36346
Gazi Baba	1026	7444	2172	10642
Karpos	1186	2380	829	4395
Kisela Voda	2012	8700	2396	13108
Centar	140	690	248	1078
Cair	1081	5064	978	7123
Berovo	4379	22852	3935	31166
Bitola	7100	37943	7811	52854
Brod	1173	3799	739	5711
Valandovo	249	2208	382	2839
Vinica	1684	8012	1946	11642
Gevgelija	1137	6102	2358	9597
Gostivar	5481	15885	5882	27248
Debar	2432	7842	2389	12663
Delcevo	3365	12865	2110	18340
Demir Hisar	832	5232	1002	7066
Kavadarci	1415	5858	2271	9544
Kicevo	2770	11067	2852	16689
Kocani	2157	10735	2107	14999
Kratovo	1185	7362	813	9360
Kriva Palanka	1790	9063	1947	12800
Krusevo	1695	6026	862	8583
Kumanovo	5441	26990	11558	43989
Negotino	889	3168	1782	5839
Ohrid	1693	8053	2511	12257
Prilep	8644	44696	8249	61589
Probistip	1782	6534	2971	11287
Radovis	2066	12884	3137	18087
Resen	742	3192	914	4848
Sveti Nikole	2370	13202	3980	19552
Struga	2339	7248	2209	11796
Strumica	3892	16797	4976	25665
Tetovo	4798	19090	8551	32439
Veles	6765	23934	5327	36026
Stip	3643	12560	3402	19605
Republic of Macedonia	89353	395477	105596	590426

Table 18. Historical movements in the number of sheep

	Lambs under 1 year old	Percentage of lambs	Ewes for breeding	Rams, sterile rams and ewes	Total adult sheep	Total
1949						2387943
1950						1750701
1951						2022103
1952						2118160
1953						2194946
1954						2193170
1957			1497722		1497722	2095574
1958	448113	27.66%	1521574	98393	1619967	2068080
1959	545079	33.03%	1560829	89275	1650104	2195183
1960	452600	26.95%	1575063	104541	1679604	2132204
1961	401801	28.69%	1318075	82607	1400682	1802483
1962	515381	34.86%	1382920	95494	1478414	1993795
1963	416527	27.27%	1430142	97435	1527577	1944104
1964	381146	25.41%	1404537	95547	1500084	1881230
1965	428173	31.12%	1286064	89960	1376024	1804197
1966	486161	32.17%	1400779	110471	1511250	1997411
1967	508120	31.90%	1491678	101296	1592974	2101094
1968	552139	33.58%	1534042	110292	1644334	2196473
1974	499938	36.78%	1257061	102088	1359149	1859087
1975	569670	40.13%	1306744	112701	1419445	1989115
1976	476712	33.34%	1332558	97202	1429760	1906472
1977	418028	28.89%	1350527	96454	1446981	1865009
1978	459181	31.58%	1356564	97482	1454046	1913227
1979	514563	34.77%	1388710	91000	1479710	1994273
1980	552888	36.75%	1401443	103192	1504635	2057523
1981	580852	37.57%	1432982	113022	1546004	2126856
1982	585454	46.50%	1146501	112457	1258958	1844412
1983	675866	43.54%	1439282	113084	1552366	2228232
1984	523013	32.53%	1492366	115537	1607903	2130916
1985	565472	32.22%	1610109	144846	1754955	2320427
1986	543985	29.82%	1688386	135702	1824088	2368073
1987	572130	29.63%	1779963	151113	1931076	2503206
1988	555245	30.47%	1666002	156542	1822544	2377789
1989	622519	33.24%	1726740	146251	1872991	2495510
1990	522507	29.44%	1612527	162081	1774608	2297115
1994	577288	30.56%	1710338	178473	1888811	2466099
1995	423377	22.32%	1736717	159851	1896568	2319945
1996	473617	35.34%	1232890	107388	1340278	1813895
1997	359646	28.29%	1177724	93664	1271388	1631034
1998	289127	28.18%	947263	78786	1026049	1315176
1999	332949	34.84%	868661	87123	955784	1288733
2000	290051	30.19%	887057	73578	960635	1250686
2001	317427	32.80%	896769	70903	967672	1285099

Table 19. Number and percentage of slaughtered and died sheep

		At a beginning of a year		Slaughtered		Died		At the end of the year	
		No	No	%	No	%	No	%	
	1958	2089000	269000	12.88%	238000	11.39%	2211000	105.84%	
	1959	2211000	227000	10.27%	262000	11.85%	2213000	100.09%	
	1960	2213000	236000	10.66%	257000	11.61%	1859000	84.00%	
	1961	1859000	189000	10.17%	167000	8.98%	1994000	107.26%	
	1962	1994000	201000	10.08%	222000	11.13%	1944000	97.49%	
	1963	1944000	213000	10.96%	233000	11.99%	1881000	96.76%	
	1964	1881000	190000	10.10%	208000	11.06%	1804000	95.91%	
	1965	1804000	229000	12.69%	155000	8.59%	1997000	110.70%	
	1966	1997000	224000	11.22%	156000	7.81%	2101000	105.21%	
	1967	2101000	209000	9.95%	166000	7.90%	2196000	104.52%	
	1968	2196000	236000	10.75%	176000	8.01%	2094000	95.36%	
<i>Average %</i>				10.88%		10.03%		100.29%	
	1978	1913000	133000	6.95%	106000	5.54%	1994000	104.23%	
	1979	1994000	126000	6.32%	110000	5.52%	2058000	103.21%	
	1980	2058000	129000	6.27%	109000	5.30%	2127000	103.35%	
	1981	2127000	152000	7.15%	103000	4.84%	2162000	101.65%	
	1982	2162000	145000	6.71%	89000	4.12%	2229000	103.10%	
	1983	2229000	137000	6.15%	139000	6.24%	2131000	95.60%	
	1984	2131000	158000	7.41%	126000	5.91%	2315000	108.63%	
	1985	2315000	178000	7.69%	101000	4.36%	2320000	100.22%	
	1986	2320000	118000	5.09%	100000	4.31%	2368000	102.07%	
	1987	2368000	122000	5.15%	86000	3.63%	2503000	105.70%	
	1988	2503000	124000	4.95%	100000	4.00%	2378000	95.01%	
	1989	2378000	115000	4.84%	79000	3.32%	2496000	104.96%	
	1990	2496000	122000	4.89%	83000	3.33%	2297000	92.03%	
<i>Average %</i>				6.12%		4.65%		101.52%	
	1995	2466000	132000	5.35%	83000	3.37%	2320000	94.08%	
	1996	2320000	97000	4.18%	69000	2.97%	1814000	78.19%	
	1997	1814000	106000	5.84%	63000	3.47%	1631000	89.91%	
	1998	1631000	80000	4.90%	59000	3.62%	1315000	80.63%	
	1999	1315000	87000	6.62%	56000	4.26%	1289000	98.02%	
	2000	1289000	80000	6.21%	57000	4.42%	1251000	97.05%	
	2001	1251000	75000	6.00%	45000	3.60%	1285000	102.72%	
<i>Average %</i>				5.59%		3.67%		91.51%	

Table 20. Slaughtered sheep: number, weight and use

Sheep	Year	lambs	ewes and rams	total
Total livestock slaughtered	1995	812000	280000	1092000
	1996	259000	131000	390000
	1997	185000	52000	237000
	1998	180000	54000	234000
	1999	294000	124000	418000
Slaughtered in slaughterhouses	1995	148000	80000	228000
	1996	213000	80000	293000
	1997	135000	10000	145000
	1998	143000	6000	149000
	1999	42000	4000	46000
Average gross weight of livestock slaughtered in slaughterhouses in kg	1995	18	29	22
	1996	18	29	21
	1997	19	34	20
	1998	18	41	19
	1999	19	38	21
Rendered weight of livestock slaughtered in slaughterhouses in percents	1995	50	48	49
	1996	49	47	48
	1997	41	41	41
	1998	51	41	46
	1999	52	40	46

Tab. 21 Estimation of available food from died or slaughtered cattle from state holdings for 2001

Municipality	Number of died animals	Weight of died animals (kg)	Potentially available (2 %)	Slaughtered	Weight of slaughtered animals	Weight of offal	Potentially available (1 %)	Total weight of died animals and offal	Total potentially available food (kg)
Gazi Baba	30	8809	176	217	67186	33593	336	42402	512
[uto Orizari	0	36	1	1	272	136	1	172	2
Ba~	2	500	10	12	3811	1906	19	2405	29
Bel~i{ta	1	228	5	6	1742	871	9	1100	13
Berovo	0	136	3	3	1034	517	5	653	8
Bistrica	1	286	6	7	2178	1089	11	1374	17
Bitola	96	27725	555	684	211467	105734	1057	133459	1612
Bogdanci	19	5454	109	135	41597	20798	208	26252	317
Bogovinje	0	136	3	3	1034	517	5	653	8
Vinica	1	186	4	5	1416	708	7	893	11
Vitoli{te	8	2349	47	58	17913	8956	90	11305	137
Del~evo	4	1049	21	26	8004	4002	40	5051	61
Kavadarci	19	5575	112	138	42522	21261	213	26836	324
Ki~evo	1	407	8	10	3103	1552	16	1959	24
Krivoga{tani	3	814	16	20	6207	3103	31	3917	47
Negotino	6	1613	32	40	12305	6152	62	7766	94
Petrovec	17	4840	97	119	36914	18457	185	23297	281
Peh~evo	2	592	12	15	4519	2260	23	2852	34
Prilep	0	100	2	2	762	381	4	481	6
Radovi{	9	2591	52	64	19764	9882	99	12473	151
Sveti Nikole	22	6396	128	158	48783	24392	244	30788	372
Struga	1	193	4	5	1470	735	7	928	11
Strumica	19	5418	108	134	41324	20662	207	26080	315
Tetovo	3	921	18	23	7024	3512	35	4433	54
Topol~ani	3	864	17	21	6588	3294	33	4158	50
Capari	0	136	3	3	1034	517	5	653	8
State property MK	268	77351	1547	1909	589975	294987	2950	372338	4497
Private property MK	6284	1816133	36323	44829	13852155	6926077	69261	8742211	105583
TOTAL MK	6552	1893484	37870	46738	14442130	7221065	72211	9114549	110080

Percentage of died animals - 2.47

Average weight of died animals - 289.0

Percentage of slaughtered animals - 17.62

Percentage of offal - 50.0

Tab. 22 Estimation of available food from died or slaughtered cattle from private holdings for 1994

Municipality	Number of died animals	Weight of died animals	Potentially available (2 %)	Slaughtered	Weight of slaughtered animals	Weight of offal	Potentially available (1 %)	Total weight of died animals and offal	Total potentially available food (kg)
Skopje	321	92848	1857	2292	708177	354088	3541	446936	5398
Gazi Baba	96	27875	558	688	212611	106305	1063	134180	1621
Karpos	88	25348	507	626	193337	96669	967	122017	1474
Kisela Voda	90	26083	522	644	198945	99472	995	125556	1516
Centar	4	1121	22	28	8548	4274	43	5395	65
Cair	43	12421	248	307	94736	47368	474	59788	722
Berovo	83	24013	480	593	183156	91578	916	115591	1396
Bitola	241	69548	1391	1717	530465	265233	2652	334781	4043
Brod	74	21501	430	531	163991	81995	820	103496	1250
Valandovo	39	11300	226	279	86188	43094	431	54394	657
Vinica	29	8437	169	208	64355	32177	322	40615	491
Gevgelija	76	21829	437	539	166495	83248	832	105077	1269
Gostivar	357	103291	2066	2550	787831	393915	3939	497207	6005
Debar	42	12042	241	297	91850	45925	459	57967	700
Delcevo	117	33721	674	832	257202	128601	1286	162322	1960
Demir Hisar	61	17574	351	434	134046	67023	670	84597	1022
Kavadarci	14	4176	84	103	31851	15925	159	20101	243
Kicevo	230	66450	1329	1640	506836	253418	2534	319868	3863
Kocani	94	27247	545	673	207820	103910	1039	131157	1584
Kratovo	48	13791	276	340	105189	52595	526	66386	802
Kriva Palanka	140	40517	810	1000	309034	154517	1545	195034	2356
Krusevo	60	17346	347	428	132303	66152	662	83498	1008
Kumanovo	232	66986	1340	1653	510919	255460	2555	322446	3894
Negotino	22	6332	127	156	48293	24147	241	30478	368
Ohrid	107	31030	621	766	236676	118338	1183	149368	1804
Prilep	234	67735	1355	1672	516636	258318	2583	326053	3938
Probistip	35	10236	205	253	78075	39038	390	49274	595
Radovis	64	18510	370	457	141178	70589	706	89099	1076
Resen	95	27475	550	678	209562	104781	1048	132256	1597
Sveti Nikole	28	8116	162	200	61905	30952	310	39069	472
Struga	220	63531	1271	1568	484568	242284	2423	305815	3693
Strumica	212	61140	1223	1509	466328	233164	2332	294304	3554
Tetovo	695	200808	4016	4957	1531615	765807	7658	966615	11674
Veles	101	29260	585	722	223173	111587	1116	140847	1701
Stip	43	12285	246	303	93701	46851	469	59136	714
Republic of Macedonia	4114	1189077	23782	29351	9069418	4534709	45347	5723786	69129

Tab. 23 Estimation of available food from died or slaughtered pigs from state holdings for 2001

Municipality	Number of died animals	Weight of died animals	Potentially available (1 %)	Slaughtered	Weight of slaughtered animals	Weight of offal	Potentially available (1 %)	Total weight of died animals and offal	Total potentially available food (kg)
Gazi Baba	75	7244	72	177	16846	5896	59	13141	131
Karpo{	74	7188	72	176	16715	5850	59	13038	130
[uto Orizari	12	1156	12	28	2688	941	9	2096	21
Berovo	1867	181503	1815	4443	422076	147727	1477	329229	3292
Bitola	1415	137501	1375	3366	319753	111914	1119	249415	2494
Brvenica	1227	119292	1193	2920	277408	97093	971	216384	2164
Valandovo	128	12487	125	306	29039	10164	102	22651	227
Vasilevo	65	6342	63	155	14749	5162	52	11504	115
Vinica	1555	151144	1511	3700	351479	123018	1230	274162	2742
Gevgelija	141	13728	137	336	31923	11173	112	24901	249
Gradsko	3925	381468	3815	9338	887088	310481	3105	691949	6919
Del~evo	1097	106663	1067	2611	248041	86814	868	193478	1935
Zajas	189	18407	184	451	42804	14981	150	33388	334
Zrnovci	15	1409	14	35	3278	1147	11	2557	26
Karbinci	3785	367853	3679	9005	855428	299400	2994	667253	6673
Kratovo	1	85	1	2	197	69	1	153	2
Krivoga{tani	6	564	6	14	1311	459	5	1023	10
Kumanovo	5023	488244	4882	11951	1135392	397387	3974	885631	8856
Peh~evo	24	2340	23	57	5441	1904	19	4244	42
Prilep	50	4848	48	119	11275	3946	39	8794	88
Sveti Nikole	2671	259583	2596	6354	603650	211277	2113	470861	4709
Tetovo	33	3185	32	78	7407	2593	26	5778	58
[tip	12	1184	12	29	2753	964	10	2147	21
State property MK	23389	2273419	22734	55650	5286739	1850359	18504	4123777	41238
Private property MK	31506	3062373	30624	74962	7121418	2492496	24925	5554869	55549
TOTAL MK	54895	5335791	53358	130612	12408156	4342855	43429	9678646	96786

Percentage of died animals - 29.0
Average weight of died animals - 97.2
Percentage of slaughtered animals - 69.0
Percentage of offal - 35.0

Tab. 24 Estimation of available food from died or slaughtered pigs from private holdings for 1994

Municipality	Number of died animals	Weight of died animals	Potentially available (1 %)	Slaughtered	Weight of slaughtered animals	Weight of offal	Potentially available (1 %)	Total weight of died animals and offal	Total potentially available food (kg)
Skopje	2558	248646	2486	6086	578217	202376	2024	451022	4510
Gazi Baba	1543	150017	1500	3672	348857	122100	1221	272117	2721
Karpos	265	25792	258	631	59978	20992	210	46784	468
Kisela Voda	503	48934	489	1198	113795	39828	398	88763	888
Centar	11	1043	10	26	2425	849	8	1892	19
Cair	235	22860	229	560	53161	18606	186	41467	415
Berovo	912	88623	886	2169	206089	72131	721	160754	1608
Bitola	1364	132625	1326	3246	308413	107944	1079	240569	2406
Brod	284	27568	276	675	64108	22438	224	50006	500
Valandovo	441	42846	428	1049	99636	34873	349	77718	777
Vinica	710	68976	690	1688	160401	56140	561	125116	1251
Gevgelija	563	54741	547	1340	127298	44554	446	99295	993
Gostivar	157	15306	153	375	35594	12458	125	27764	278
Debar	0	0	0	0	0	0	0	0	0
Delcevo	1881	182856	1829	4476	425223	148828	1488	331684	3317
Demir Hisar	480	46651	467	1142	108485	37970	380	84621	846
Kavadarci	526	51133	511	1252	118908	41618	416	92751	928
Kicevo	343	33318	333	816	77480	27118	271	60436	604
Kocani	2557	248562	2486	6084	578020	202307	2023	450869	4509
Kratovo	657	63818	638	1562	148405	51942	519	115759	1158
Kriva Palanka	1447	140686	1407	3444	327160	114506	1145	255192	2552
Krusevo	129	12515	125	306	29104	10186	102	22702	227
Kumanovo	3700	359594	3596	8802	836221	292677	2927	652272	6523
Negotino	510	49526	495	1212	115171	40310	403	89836	898
Ohrid	1527	148382	1484	3632	345055	120769	1208	269151	2692
Prilep	1188	115430	1154	2826	268427	93950	939	209379	2094
Probistip	762	74106	741	1814	172331	60316	603	134422	1344
Radovis	891	86565	866	2119	201304	70456	705	157022	1570
Resen	302	29344	293	718	68238	23883	239	53227	532
Sveti Nikole	708	68807	688	1684	160008	56003	560	124810	1248
Struga	932	90624	906	2218	210743	73760	738	164385	1644
Strumica	2811	273254	2733	6689	635442	222405	2224	495659	4957
Tetovo	2010	195343	1953	4782	454262	158992	1590	354334	3543
Veles	357	34728	347	850	80758	28265	283	62993	630
Stip	517	50259	503	1230	116876	40906	409	91166	912
Republic of Macedonia	31223	3034833	30348	74288	7057375	2470081	24701	5504914	55049

Tab. 25 Estimation of available food from died or slaughtered sheep from state holdings for 2001

Municipality	Number of died animals	Weight of died animals	Potentially available (1 %)	Slaughtered	Weight of slaughtered animals	Weight of offal	Potentially available (1 %)	Total weight of died animals and offal	Total potentially available food (kg)
Gazi Baba	58	1183	12	86	2248	1191	12	2374	24
Pluto Orizari	123	2511	25	184	4773	2530	25	5041	50
Barce	29	600	6	44	1141	605	6	1205	12
Belishtë	242	4966	50	363	9438	5002	50	9968	100
Berovo	191	3923	39	287	7456	3952	40	7874	79
Bistrica	154	3155	32	231	5996	3178	32	6332	63
Bitola	39	800	8	58	1520	806	8	1605	16
Bogdanci	257	5278	53	386	10033	5317	53	10596	106
Bogovinje	139	2846	28	208	5410	2867	29	5713	57
Vinica	1	17	0	1	31	17	0	33	0
Vitolište	138	2836	28	207	5391	2857	29	5694	57
Delchevo	11	233	2	17	443	235	2	468	5
Kavadarci	47	954	10	70	1813	961	10	1915	19
Kičevo	77	1587	16	116	3017	1599	16	3187	32
Krivogaštani	47	961	10	70	1826	968	10	1929	19
Negotino	40	825	8	60	1567	831	8	1655	17
Petrovec	642	13156	132	962	25006	13253	133	26410	264
Pehčevo	74	1516	15	111	2881	1527	15	3043	30
Prilep	85	1749	17	128	3325	1762	18	3511	35
Radoviš	69	1407	14	103	2674	1417	14	2824	28
Sveti Nikole	3	63	1	5	120	64	1	127	1
Struga	353	7229	72	528	13741	7283	73	14512	145
Strumica	22	455	5	33	865	459	5	914	9
Tetovo	24	494	5	36	940	498	5	992	10
Topolčani	18	366	4	27	696	369	4	735	7
Capari	410	8402	84	614	15970	8464	85	16866	169
State property MK	3293	67514	675	4936	128324	68012	680	135525	1355
Private property MK	43870	899331	8993	65745	1709368	905965	9060	1805295	18053
TOTAL MK	47163	966844	9668	70680	1837692	973977	9740	1940821	19408

Percentage of died animals - 3,67
Average weight of died animals - 20,5
Percentage of slaughtered animals - 5,5
Percentage of offal - 53

Tab. 26 Estimation of available food from died or slaughtered sheep from private holdings for 1994

Municipality	Number of died animals	Weight of died animals	Potentially available (1 %)	Slaughtered	Weight of slaughtered animals	Weight of offal	Potentially available (1 %)	Total weight of died animals and offal	Total potentially available food (kg)
Skopje	1334	27345	273	1999	51975	27547	275	54892	549
Gazi Baba	391	8007	80	585	15218	8066	81	16072	161
Karpos	161	3307	33	242	6285	3331	33	6638	66
Kisela Voda	481	9862	99	721	18744	9935	99	19796	198
Centar	40	811	8	59	1542	817	8	1628	16
Cair	261	5359	54	392	10186	5399	54	10758	108
Berovo	1144	23448	234	1714	44567	23621	236	47068	471
Bitola	1940	39765	398	2907	75581	40058	401	79823	798
Brod	210	4297	43	314	8167	4328	43	8625	86
Valandovo	104	2136	21	156	4060	2152	22	4288	43
Vinica	427	8759	88	640	16648	8823	88	17582	176
Gevgelija	352	7220	72	528	13724	7274	73	14494	145
Gostivar	1000	20500	205	1499	38965	20651	207	41151	412
Debar	465	9527	95	696	18108	9597	96	19124	191
Delcevo	673	13798	138	1009	26226	13900	139	27698	277
Demir Hisar	259	5316	53	389	10104	5355	54	10671	107
Kavadarci	350	7180	72	525	13648	7233	72	14414	144
Kicevo	612	12556	126	918	23865	12649	126	25205	252
Kocani	550	11284	113	825	21449	11368	114	22652	227
Kratovo	344	7042	70	515	13385	7094	71	14136	141
Kriva Palanka	470	9630	96	704	18304	9701	97	19331	193
Krusevo	315	6457	65	472	12274	6505	65	12962	130
Kumanovo	1614	33095	331	2419	62904	33339	333	66434	664
Negotino	214	4393	44	321	8350	4425	44	8818	88
Ohrid	450	9222	92	674	17528	9290	93	18511	185
Prilep	2260	46336	463	3387	88072	46678	467	93015	930
Probistip	414	8492	85	621	16140	8554	86	17046	170
Radovis	664	13608	136	995	25864	13708	137	27316	273
Resen	178	3647	36	267	6933	3674	37	7322	73
Sveti Nikole	718	14710	147	1075	27959	14818	148	29528	295
Struga	433	8875	89	649	16868	8940	89	17815	178
Strumica	942	19309	193	1412	36701	19452	195	38761	388
Tetovo	1191	24405	244	1784	46388	24586	246	48991	490
Veles	1322	27104	271	1981	51517	27304	273	54408	544
Stip	720	14750	147	1078	28035	14859	149	29608	296
Republic of Macedonia	21669	444207	4442	32473	844309	447484	4475	891691	8917



Fig. 1 Old territorial division on municipalities of Macedonia

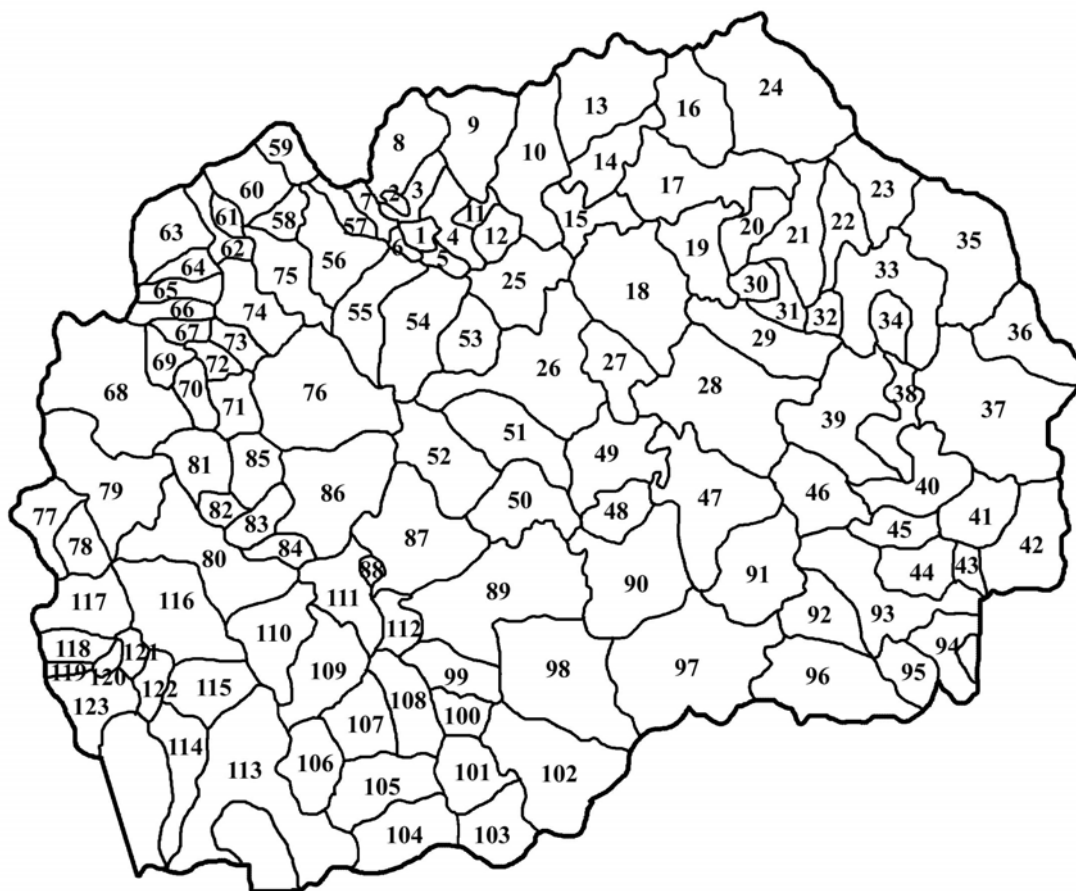


Fig. 2 New territorial division on municipalities of Macedonia

1. Centar	23. Makedonska	49. Gradsko	74. Brvenica	100. Dobru{ev
2. [uto	Kamenica	50. Izvor	75. @elino	o
3. Orizari	24. Kriva	51. ^a{ka	76. Samokov	101. Novaci
4. Gazi Baba	Palanka	52. Bogomila	77. Debar	102. Staravin
5. Kisela Voda	25. Petrovec	53. Zelenikovo	78. Centar @upa	a
6. Karpo{	26. Veles	54. Studeni~ani	79. Rostu{e	103. Ba~
7. \or~e	27. Lozovo	55. Sopi{te	80. Drugovo	104. Bistrica
Petrov	28. [tip	56. Saraj	81. Zajas	105. Bitola
8. ^u~er	29. Karbinci	57. Kondovo	82. Ki~evo	106. Capari
Sandevo	30. ^e{inovo	58. Jegunovce	83. Vrane{tica	107. Kukure~a
9. Lipkovo	31. Oble{evo	59. Vratnica	84. Plasnica	ni
10. Kumanovo	32. Zrnovci	60. Tearce	85. Oslomej	108. Mogila
11. Ara~inovo	33. Vinica	61. \ep~i{te	86. Makedonski	109. Demir
12. Ilinden	34. Blatec	62. Tetovo	Brod	Hisar
13. Staro	35. Del~evo	63. [ipkvica	87. Dolneni	110. Sopotnic
Nagori~ane	36. Peh~evo	64. Kamenjane	88. @ito{e	a
14. Kle~evce	37. Berovo	65. Bogovinje	89. Prilep	111. Kru{evo
15. Ora{ac	38. Podarec	66. Negotino	90. Kavadarci	112. Krivoga{
16. Rankovce	39. Radovi{	Polog	91. Demir	tani
17. Kratovo	40. Vasilevo	67. Vrap~i{te	Kapija	113. Resen
18. Sveti	41. Bosilovo	68. Mavrovi	92. Miravci	114. Ohrid
Nikole	42. Novo Selo	Anovi	93. Valandovo	115. Kosel
19. Probi{tip	43. Murtino	69. Vrutok	94. Star Dojran	116. Bel~i{ta
20. Zletovo	44. Kukli{	70. Dolna	95. Bogdanci	117. Lukovo
21. Ko~ani	45. Strumica	Banjica	96. Gavgelija	118. Labuni{t
22. Orizari	46. Kon~e	71. Srbinovo	97. Konopi{te	e
	47. Negotino	72. Gostivar	98. Vitolo{te	119. Vev~ani
	48. Rosoman	73. ^egrane	99. Topol~ani	120. Vele{ta

121. Delogo`d 122. Me{ei{ta 123. Struga
i

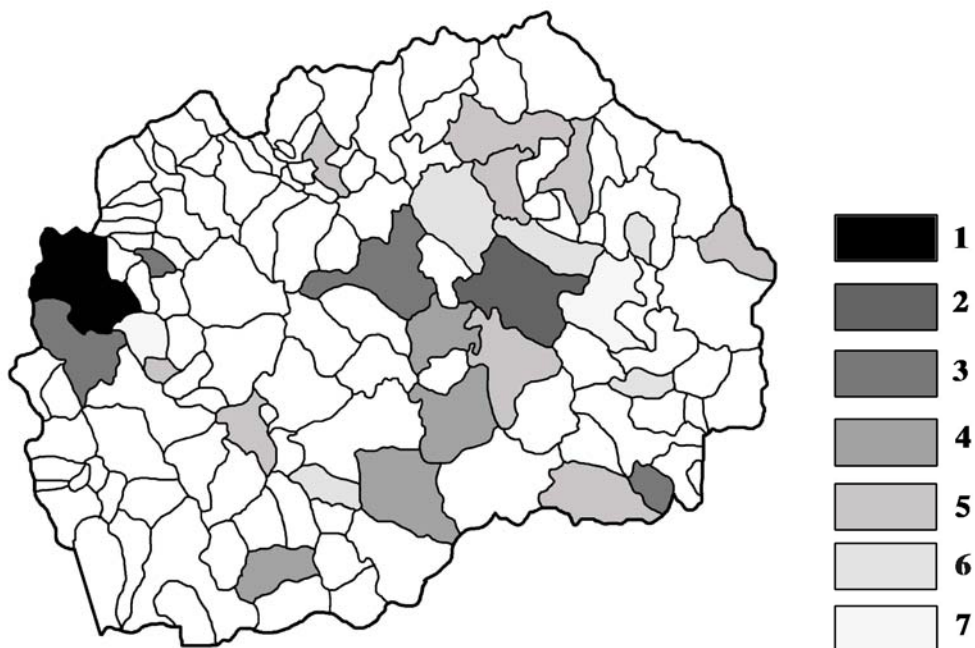


Fig. 3 Cattle in state property holdings
1 - 3000-5000; 2 - 1000-3000; 3 - 500-1000; 4 - 200-500; 5 - 100-200; 6 - 50-100; 7 - <50

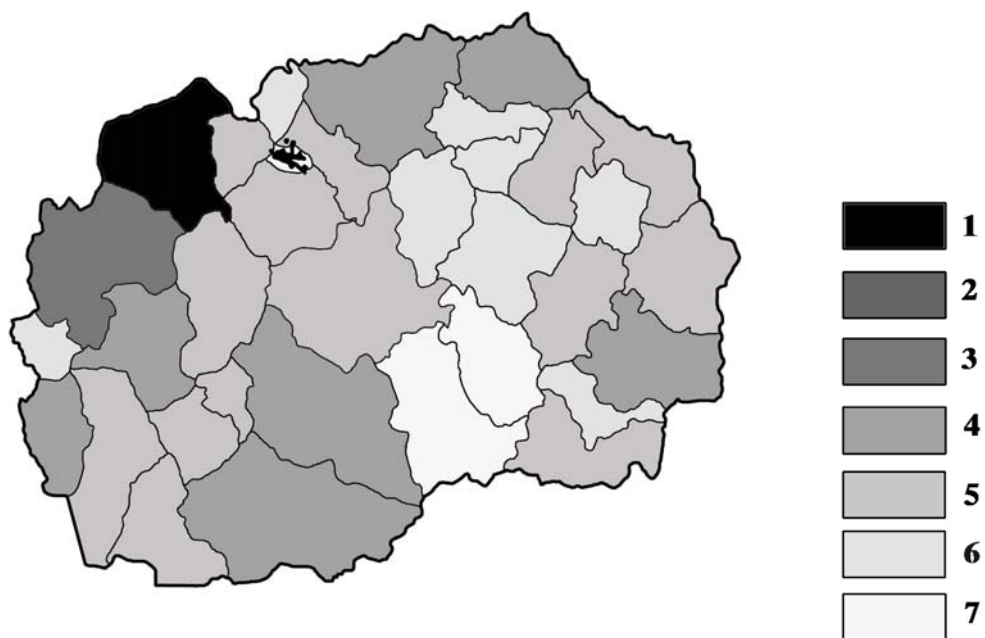


Fig. 4 Cattle in private property holdings
1 - 20000-30000; 2 - 15000-20000; 3 - 10000-15000; 4 - 5000-10000;
5 - 2000-5000; 6 - 1000-2000; 7 - <1000

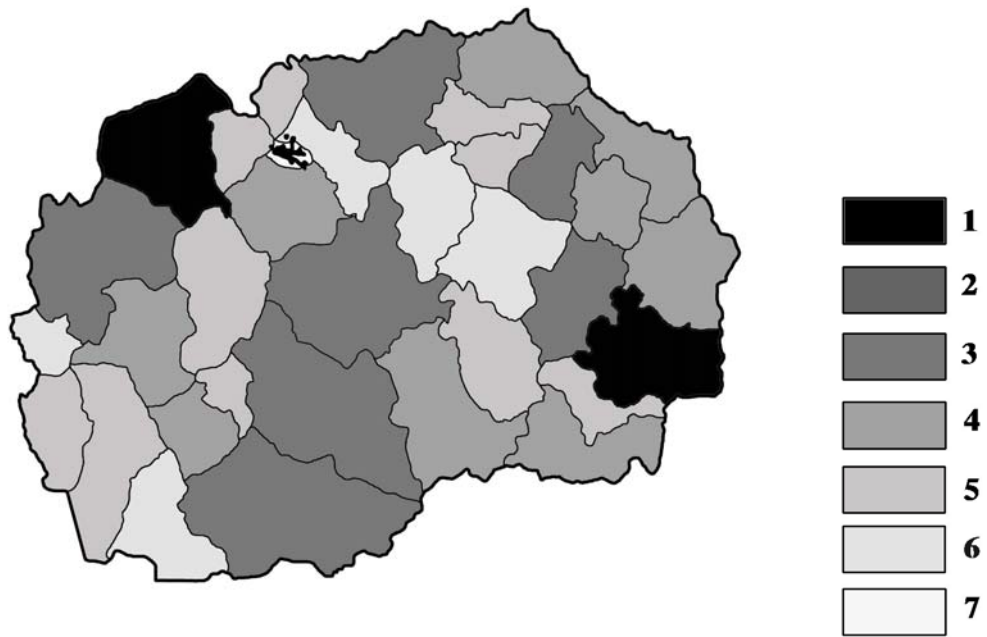


Fig. 5 Horses in private property holdings
 1 - 5000-10000; 3 - 2500-5000; 4 - 1500-2500; 5 - 1000-1500; 6 - 100-1000; 7 - <100

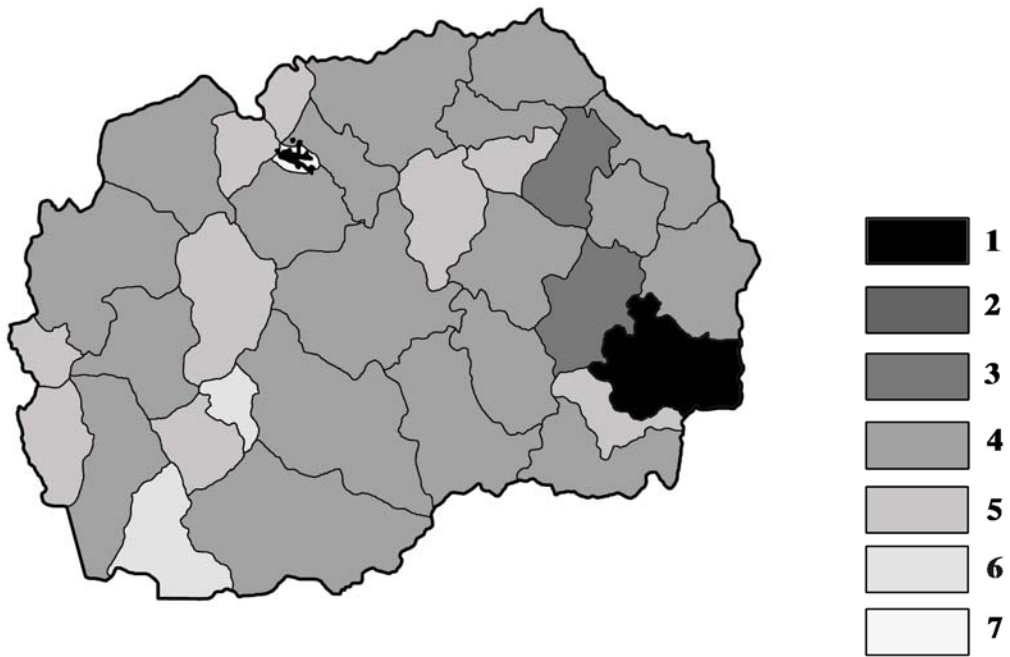


Fig. 6 Goats in private property holdings
 1 - > 10000; 3 - 5000-10000; 4 - 2000-5000; 5 - 1000-2000; 6 - 100-1000; 7 - <100

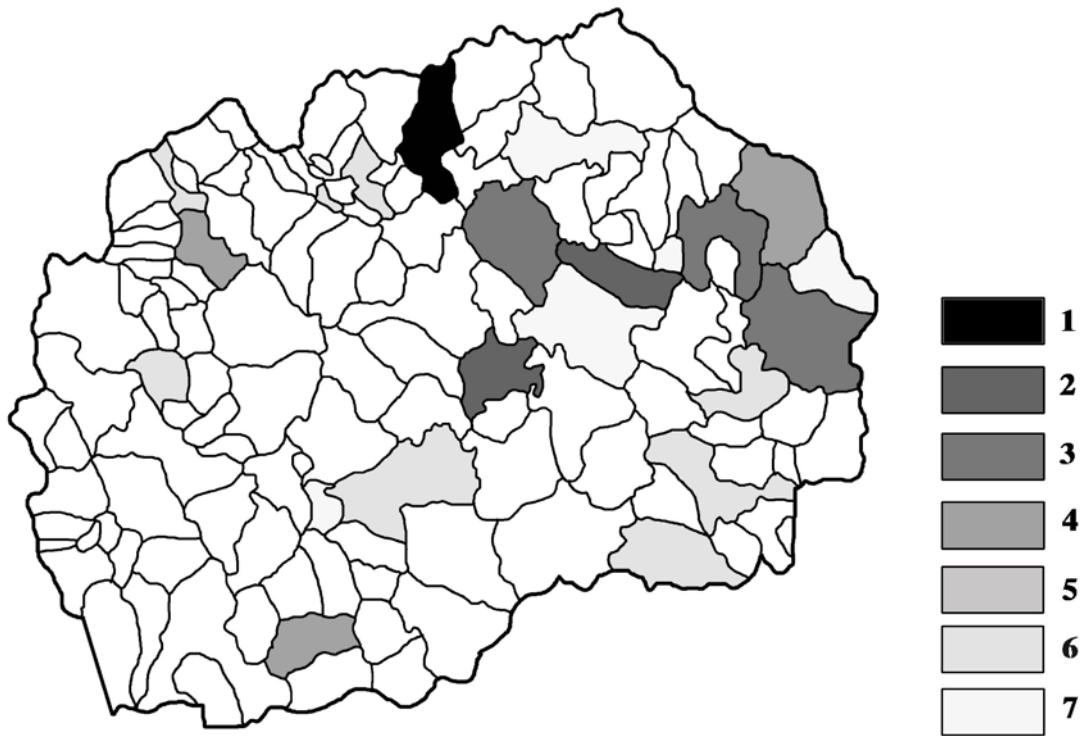


Fig. 7 Pigs in state property holdings
 1 - 15000-20000; 2 - 10000-15000; 3 - 5000-10000; 4 - 3000-5000;
 5 - 1000-3000; 6 - 100-1000; 7 - <100

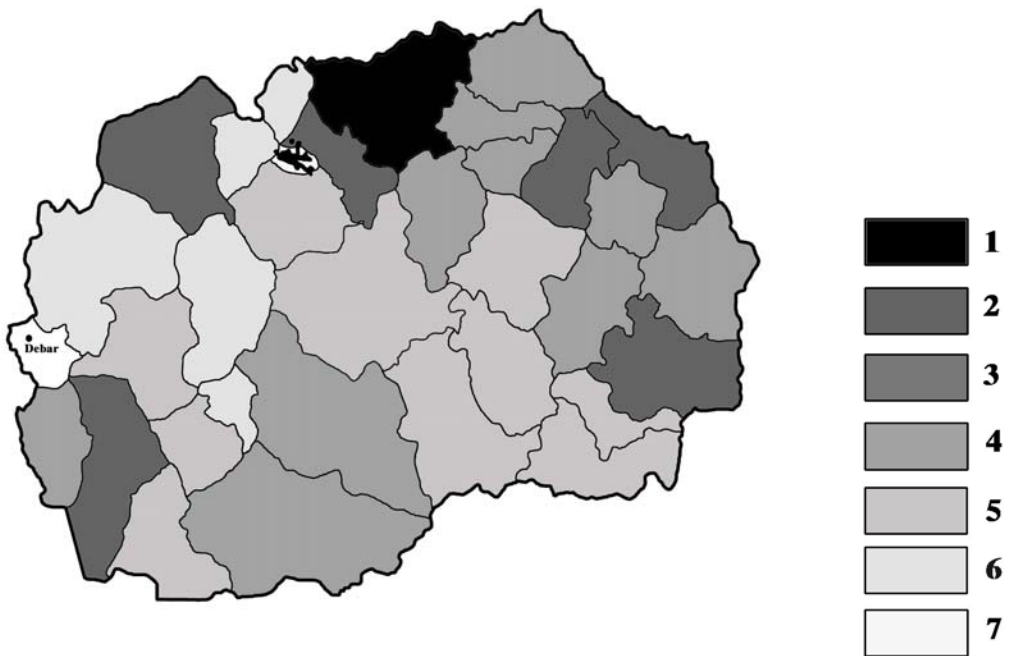


Fig. 8 Pigs in private property holdings
 1 - 10000-15000; 3 - 5000-10000; 4 - 2000-5000;
 5 - 1000-2000; 6 - 100-1000; 7 - <100

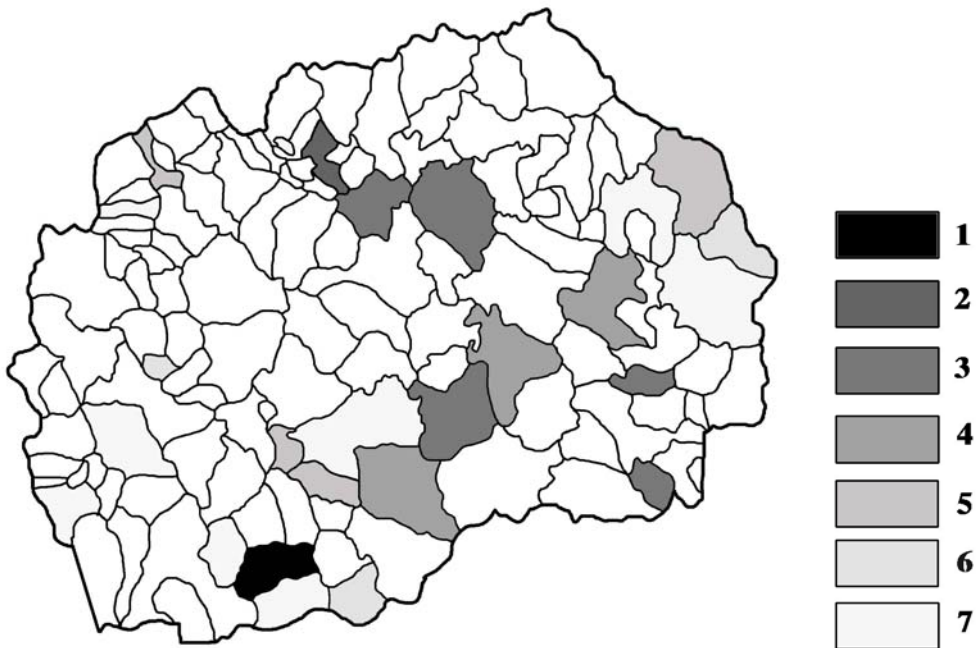


Fig. 9 Sheep in state property holdings
 1 - 15000-20000; 2 - 10000-15000; 3 - 5000-10000; 4 - 3000-5000;
 5 - 1000-3000; 6 - 100-1000; 7 - <100

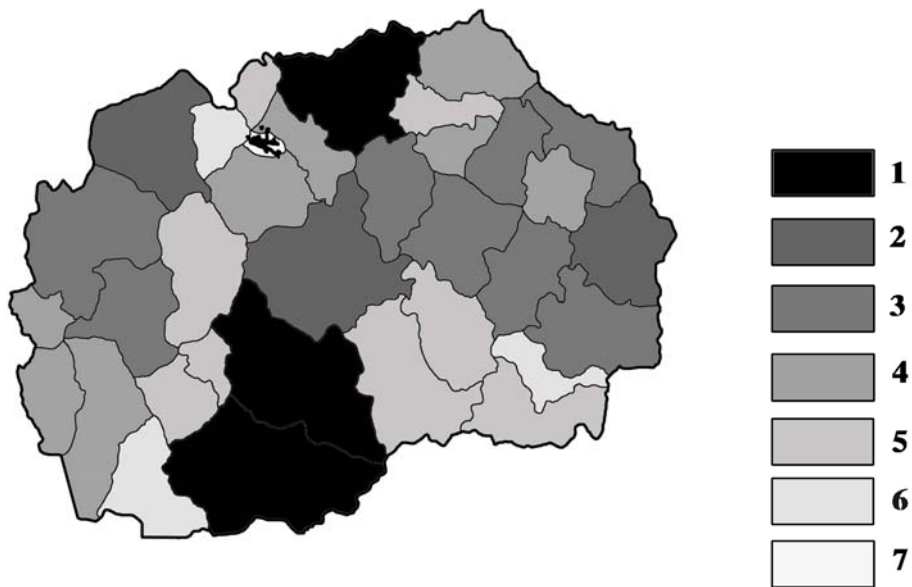


Fig. 10 Sheep in private property holdings
 1 - >40000; 2 - 30000-40000; 3 - 15000-30000; 4 - 10000-15000;
 5 - 5000-10000; 6 - 2000-5000; 7 - <2000

Cover page photo:

A cow probably killed by Brown Bear, found in the valley of Patishka Reka river (Skopje region, 10 km from the Matka canyon) in October, 2001.

Photo: S. Hristovski