

E. Livestock

Livestock are an integral part of the Bhutanese farming system. The value of keeping livestock extends beyond the immediate benefits of milk, meat, and fibre production. In many areas, the primary purpose of keeping livestock is to provide draught power and to supply manure to support crop production. In addition, livestock also provide a sense of security for rural farmers in times of crop failure since they can be exchanged readily for cash or food grain. There is a strong emphasis on milk production and processing at the household level since butter and the local cheese are major components of the Bhutanese diet.

The main types of livestock owned and reared by farmers are cattle, yak, buffalo, equine (horses, mules, and donkeys), sheep, goats, pigs, and poultry. Open grazing continues to be the main source of fodder for the majority of livestock since both improved pastures and stall feeding remain limited.

Due to strong religious sentiments, culling of livestock is quite limited and in most cases animals (including poultry) are kept for purposes other than meat. However, animals that die naturally or that die as a result of accidents are consumed or sold. In rural areas people still eat very little meat although meat consumption is increasing among the urban population. A fair amount of meat is imported to meet the country's growing need but the values for this are not included here.

The following maps and tables are presented in this section:

- E.1. Population of Cattle, Yak and Equine
- E.2. Population of Sheep, Goats and Pigs
- E.2A. Farm Households Owning Cattle, Yak, Equine and Buffalo (Table only)
- E.2B. Farm Households Owning Sheep, Goats, Pigs and Poultry (Table only)
- E.3. Production of Milk, Butter, and Cheese
- E.4. Meat Production from Farm Livestock
- E.5. Consumption of Farm-Produced Meat
- E.6. Milk Availability and Production by Local, Jersey and Brown Swiss Cattle
- E.7. Sources of Livestock Feed and Fodder



Population of Cattle, Yak and Equine

Table E.1 shows the population of cattle, yak, and equine (horses, mules, and donkeys) in each district in 2000, with the districts listed in descending order of total number of animals. The map shows the districts ranked according to the total population of animals; the superimposed pie charts show the proportion of each animal type and indicate differences in the total population per district.

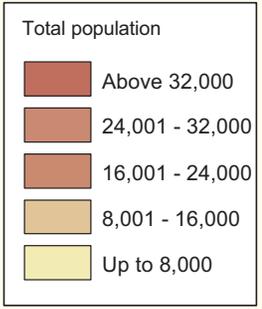
In 2000, the total population of cattle in the country was 320,510, of yak (including crossbreeds) 34,936, and of equine 27,882. In addition, there were 1800 buffaloes concentrated in the southern belt, but these constitute an insignificant 0.3% of the total livestock population and were not included in the maps. Generally both cattle and equine are found in all districts, while yak, due to their adaptation to cold climates, are only found at higher altitudes. Trashigang had the highest number of cattle (>30,000) and Gasa the lowest (<1000); Trashigang also had the highest equine population (>5000) and Samtse the lowest (only 311); and Thimphu had the highest number of yak (>8,500), with few or none in 13 districts, primarily in the south.

Table E.1

District	Cattle	Yak	Equine	Total	District	Cattle	Yak	Equine	Total
Trashigang	30,825	7,369	5025	43,219	Lhuntse	14,089	44	1950	16,083
Samtse	29,341	0	311	29,652	Tsirang	14,695	0	349	15,044
Mongar	26,635	46	2655	29,336	Dagana	14,296	0	426	14,722
Sarpang	26,611	0	482	27,093	Trashi Yangtse	12,505	115	1987	14,607
Wangdue	20,893	3,057	1821	25,771	Bumthang	10,002	2,672	1414	14,088
Chhukha	24,870	12	657	25,539	Zhemgang	12,156	0	1678	13,834
S/Jongkhar	21,967	60	2399	24,426	Punakha	12,125	24	1064	13,213
Thimphu	6,990	8,699	1045	16,734	Trongsa	11,336	0	446	11,782
Ha	9,639	5,629	1365	16,633	Pemagatshel	8,570	0	923	9,493
Paro	12,102	3,158	1237	16,497	Gasa	863	4,051	648	5,562
					Bhutan Total	320,510	34,936	27,882	383,328

Population of Cattle, Yak and Equine

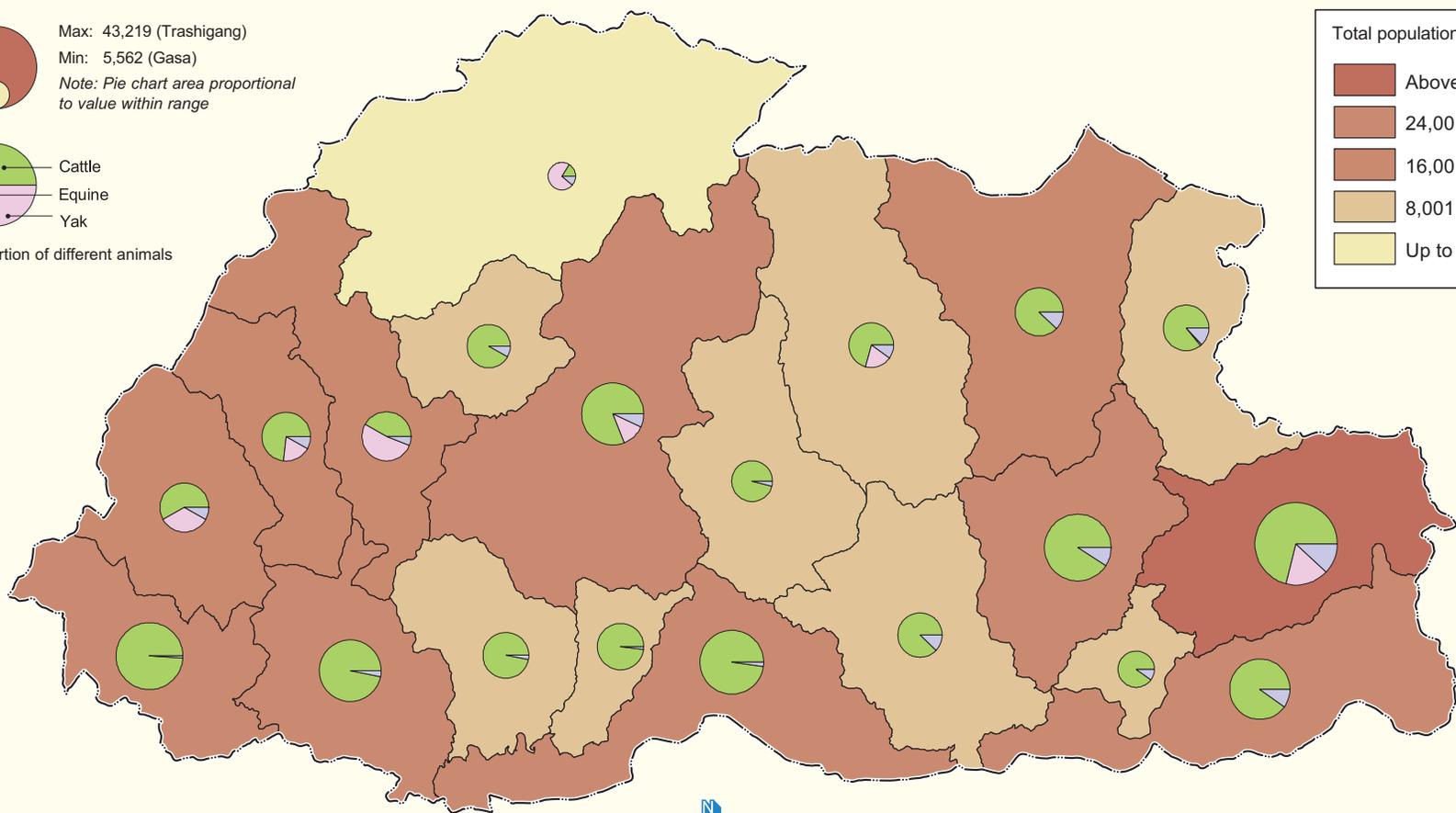
LEGEND



Max: 43,219 (Trashigang)
 Min: 5,562 (Gasa)
 Note: Pie chart area proportional to value within range

Cattle
 Equine
 Yak

Proportion of different animals



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
 Ministry of Agriculture
 Data Source: RNR Statistics 2000, Ministry of Agriculture



Population of Sheep, Goats and Pigs

Table E.2 shows the population of sheep, goats, and pigs in each district in 2000, with the districts listed in descending order of total number of animals. The map shows the districts ranked according to the total population of animals; the superimposed pie charts show the proportion of each type and indicate differences in the total population per district.

In 2000, there were 22,879 sheep, 41,404 pigs, and 31,328 goats in the country, nearly 96,000 animals. Almost 20% of the total were in Samtse (>17,000). Trashigang had the most sheep and pigs (>5000 of each), and Samtse the most goats (>11, 000). Overall, there were very few animals in Thimphu (786) and Gasa (234).

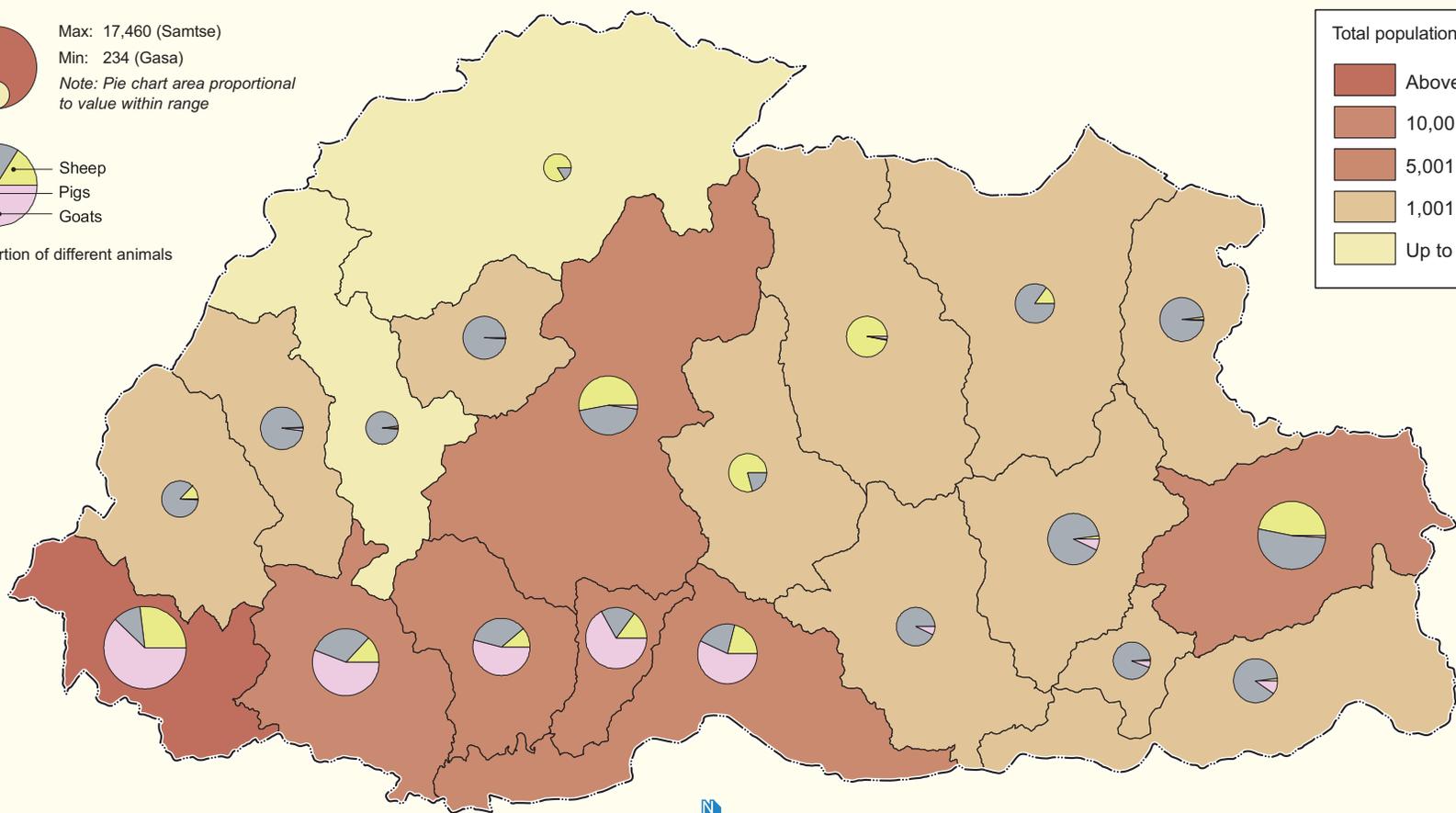
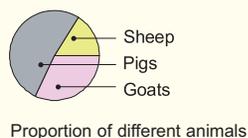
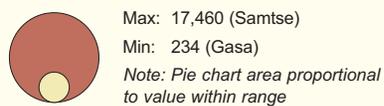
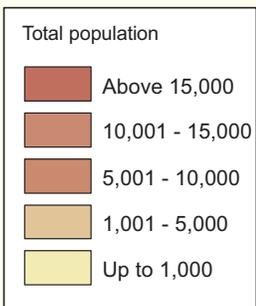
Table E.2

District	Sheep	Pigs	Goats	Total	District	Sheep	Pigs	Goats	Total
Samtse	4,659	1,885	10,916	17,460	Punakha	0	2,640	15	2,655
Trashigang	5,047	5,643	104	10,794	Paro	15	2,511	58	2,584
Chhukha	1,375	3,154	5,739	10,268	Bumthang	2,147	30	28	2,205
Tsirang	1,189	1,451	5,441	8,081	Lhuntse	279	1,617	7	1,903
Sarpang	1,588	1,640	4,371	7,599	Zhemgang	7	1,618	112	1,737
Wangdue	3,884	3,304	139	7,327	Trongsa	1,337	350	7	1,694
Dagana	732	2,378	3,612	6,722	Pemagatshel	20	1,414	91	1,525
Mongar	105	4,398	341	4,844	Ha	173	1,179	12	1,364
S/Jongkhar	61	2,599	281	2,941	Thimphu	18	762	6	786
Trashigang	47	2,793	48	2,888	Gasa	196	38	0	234
					Bhutan Total	22,879	41,404	31,328	95,611



Population of Sheep, Goats and Pigs

LEGEND



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
Ministry of Agriculture
Data Source: RNR Statistics 2000, Ministry of Agriculture



Farm Households Owning Cattle, Yak, Equine and Buffalo

Table E.2A shows the percentage of farm households owning cattle, yak (including crossbreeds), and equine (horses, mules, and donkeys) in each district in 2000, with the districts listed in alphabetical order.

Cattle constitute the most important livestock for farm households in Bhutan because of their manifold uses. Nearly 90% or more of farm households in Ha, Trongsa, and Wangdue owned cattle; with the lowest percentage (still 58%) in Gasa. Very few households owned yak with the highest percentage in Gasa (41%) followed by Ha (20%), but none to less than 10% in all other districts. Although Thimphu and Trashigang had the highest number of yak (Table E.1), these were owned by only 7% and 5% of farm households, respectively. Gasa had the highest percentage of households owning equine (65%) followed by Zhemgang (51%). Both of these districts had over 50% of their households situated in locations more than 8 hours walking distance from the main road (Table G.4). Less than 5% of households owned buffalo in any district.

Table E.2A

District	Cattle	Yak	Equine	Buffalo	District	Cattle	Yak	Equine	Buffalo	
Bumthang	82	11	34	0	Samtse	75	0	2	3	
Chhukha	78	<1	9	<1	Sarpang	80	0	9	3	
Dagana	83	0	12	1	S/Jongkhar	69	<1	33	<1	
Gasa	57	41	65	0	Thimphu	69	7	17	0	
Ha	92	20	42	<1	Trashigang	71	5	31	0	
Lhuntse	78	<1	41	0	Trashi Yangtse	70	<1	37	0	
Mongar	83	<1	34	0	Tsirang	82	0	9	5	
Paro	80	3	19	0	Trongsa	90	0	19	0	
Pemagatshel	67	0	24	0	Wangdue	89	6	32	0	
Punakha	87	<1	24	0	Zhemgang	87	0	51	0	
						Average*	78	2	24	<1

* Simple averages, not weighted

Farm Households Owning Sheep, Goats, Pigs and Poultry

Table E.2B shows the percentage of farm households owning sheep, goats, pigs, and poultry in each district in 2000, with the districts listed in alphabetical order.

Poultry were owned by half or more of all households in all districts except Gasa (38%) and Trashy Yangtse (48%), with a maximum in Dagana (79%). Pigs were the second most common small livestock. Punakha had the highest percentage of households owning pigs (68%) followed by Wangdue (57%), and Bumthang the least (<1%) followed by Gasa (11%). Household ownership of goats was relatively small and concentrated predominantly in the five southwest districts of Tsirang (63%), Samtse, Dagana, Chhukha, and Sarpang. Sheep were even less common; Bumthang had the highest percentage of households owning sheep (21%).

Table E.2B

District	Sheep	Goats	Pigs	Poultry	District	Sheep	Goats	Pigs	Poultry
Bumthang	21	<1	<1	58	Samtse	15	48	22	78
Chhukha	6	38	46	78	Sarpang	9	34	25	63
Dagana	8	48	51	79	S/Jongkhar	<1	2	29	54
Gasa	2	0	11	38	Thimphu	<1	<1	28	46
Ha	<1	<1	47	74	Trashigang	6	<1	39	62
Lhuntse	1	<1	40	78	Trongsa	11	<1	19	63
Mongar	<1	5	47	73	Tsirang	12	63	35	78
Paro	<1	1	52	50	Trashy Yangtse	<1	<1	49	48
Pemagatshel	<1	2	25	50	Wangdue	10	2	57	63
Punakha	0	<1	60	68	Zhemgang	<1	3	46	74
					Average*	6	16	38	66
* Simple averages, not weighted									

Production of Milk, Butter and Cheese

Almost all processing and production of milk, butter, and cheese is at the farm household level. The main kind of cheese produced is a soft fresh cheese called churpi (sometimes dried) which is used widely in Bhutanese cooking. Bhutan has only recently started to introduce central processing centres in urban areas. Table E.3 shows the total production of milk, the amount processed into butter and cheese in 2000, the amount left as milk, and the total production of butter and cheese with the districts listed in descending order of total milk production. The map shows the districts ranked according to total milk production and the superimposed bar charts the total production of 'end products' (remaining milk, and butter and cheese).

The total production of milk in 2000 was about 25 million litres, of which more than 20 million litres or about 83% was processed to produce around 1,300t of butter and 2,200t of cheese. Sarpang, Chhukha, and Mongar districts produced the largest quantities of milk in the country (>2 million litres each). The production of both butter and cheese was highest in Chhukha, followed by Trashigang and Mongar for butter and Trashigang and Wangdue for cheese. The census statistics show that 27% of all butter and 34% of all cheese produced was sold by farmers for cash (see Table F.4).

The production of milk is not in direct proportion to the population of cattle and yak, mainly because cattle and yak are also bred for transport and the population includes lactating and non-lactating cows as well as bulls; there are also differences in productivity between different breeds (see Table E.6).

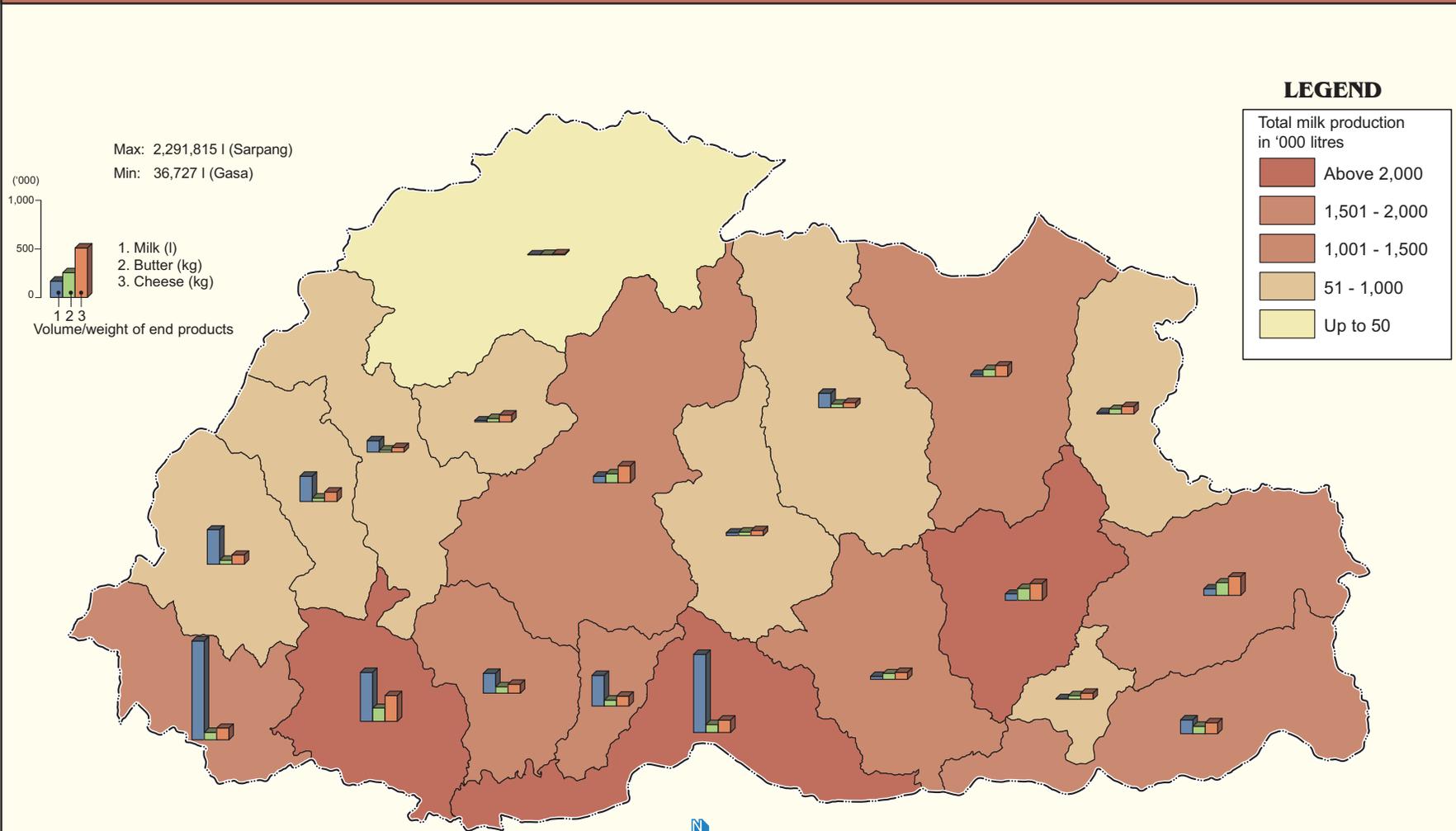
Table E.3

District	Milk Production		End Products			District	Milk Production		End Products		
	Total ('000 litres)	Amount Processed ('000 litres)	Milk* ('000 l)	Butter (kg)	Cheese (kg)		Total ('000 litres)	Amount Processed ('000 litres)	Milk* ('000 l)	Butter (kg)	Cheese (kg)
Sarpang	2,292	1,460	832	86,447	132,506	Lhuntse	1,098	1,074	24	75,974	115,336
Chhukha	2,266	1,746	520	139,653	272,377	Ha	950	584	366	43,621	98,148
Mongar	2,051	1,987	64	123,307	178,585	Trongsa	944	913	31	39,944	54,705
Trashigang	1,984	1,917	67	132,696	196,477	Paro	929	659	270	38,882	102,370
Samtse	1,838	786	1,052	79,637	124,405	Trashy Yangtse	864	851	13	49,089	76,873
S/Jongkhar	1,655	1,508	147	78,482	115,331	Pemagatshel	824	815	9	40,275	63,903
Wangdue	1,463	1,393	70	93,918	180,163	Bumthang	747	595	152	40,165	55,207
Dagana	1,331	1,121	210	67,927	95,735	Punakha	678	663	15	40,058	76,671
Zhemgang	1,157	1,126	31	58,651	73,540	Thimphu	575	452	123	20,618	45,889
Tsirang	1,154	829	325	61,317	104,188	Gasa	37	35	2	5,411	10,432
						Bhutan Total	24,837	20,514	4,323	1,316,072	2,172,841

* Total not processed into butter or cheese



Production of Milk, Butter and Cheese



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
 Ministry of Agriculture
 Data Source: RNR Statistics 2000, Ministry of Agriculture



Meat Production from Farm Livestock

Farm meat, especially beef, is limited because people generally do not slaughter their domestic cattle. Beef produced on farm mainly comprises animals that have died a natural death or have been killed by accidents or by wild animals. People do, however, slaughter yak, pigs, sheep, chickens, and goats for their own consumption and sale. Meat production was calculated from estimates given by respondents in the census enumeration.

Table E.4 shows the total weight of farm-produced meat together with the amount of different types, listed in descending order of total production. The map shows the districts ranked according to the total meat production; the superimposed pie charts show the proportion of each type and indicate differences in the total production per district.

In 2000, beef accounted for more than 85% of the total weight of farm-produced meat. The total meat production was very low, amounting to little more than 2kg per head per year. Trashigang had the highest production of meat followed by Mongar and Wangdue, and Gasa the lowest. Trashigang also had the highest production of beef with about 18% of the total for the country, followed by Wangdue, Zhemgang, and Mongar. Pork accounted for about 11% of total meat production, with the greatest amount in Paro, and chicken and mutton together accounted for about 3%.

Table E.4

District	Total Meat Production (kg)					District	Total Meat Production (kg)				
	Beef	Pork	Mutton	Chicken	Total		Beef	Pork	Mutton	Chicken	Total
Trashigang	251,551	22,609	3,144	240	277,544	Bumthang	57,948	0	507	84	58,539
Mongar	179,763	10,949	541	294	191,547	Thimphu	45,208	10,929	155	54	56,346
Wangdue	119,110	9,741	1,240	101	130,192	Chhukha	26,804	22,334	4,212	2,820	56,170
Zhemgang	120,817	6,350	283	357	127,807	Paro	27,150	25,653	152	8	52,963
S/Jongkhar	92,259	7,427	150	441	100,277	Ha	33,438	8,764	203	71	42,476
Punakha	90,253	9,400	0	106	99,759	Samtse	13,467	11,941	10,031	6,297	41,736
Yangtse	83,451	3,402	0	46	86,899	Sarpang	26,320	4,099	1,807	2,541	34,767
Lhuntse	72,598	3,147	1,027	123	76,895	Dagana	16,155	10,338	5,389	2,835	34,717
Trongsa	74,466	1,608	333	173	76,580	Tsirang	9,523	11,789	6,649	4,635	32,596
Pemagatshel	55,322	5,747	0	53	61,122	Gasa	14,113	349	0	0	14,462
						Bhutan Total	1,409,716	186,576	35,823	21,279	1,653,394

Meat Production from Farm Livestock

Max: 278 t (Trashigang)
Min: 14 t (Gasa)
Note: Pie chart area proportional to value within range

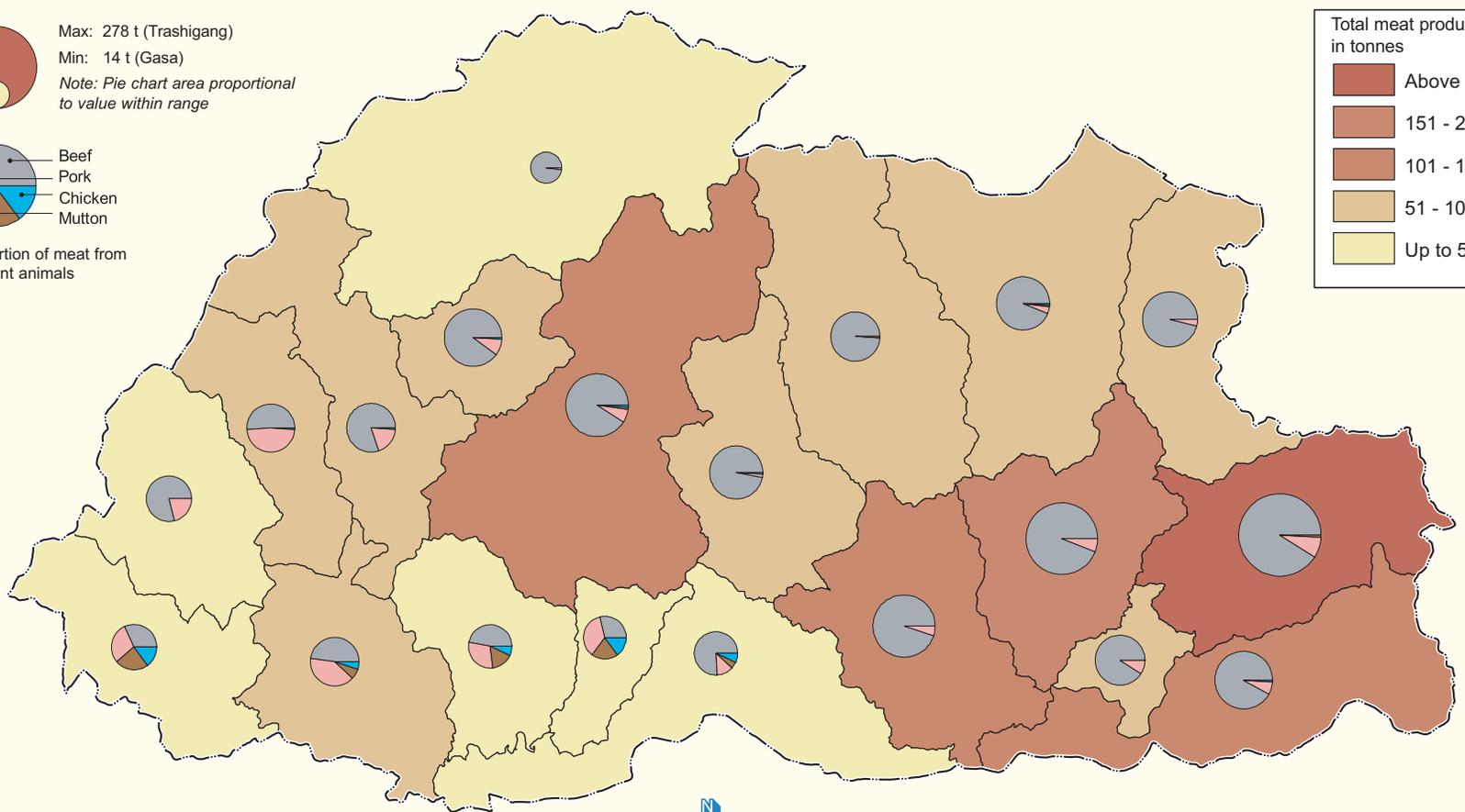
Beef
Pork
Chicken
Mutton

Proportion of meat from different animals

LEGEND

Total meat production in tonnes

- Above 200
- 151 - 200
- 101 - 150
- 51 - 100
- Up to 50



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
Ministry of Agriculture
Data Source: RNR Statistics 2000, Ministry of Agriculture



Consumption of Farm-Produced Meat

Meat consumption was calculated from the estimates of average consumption given by the farm households in the census enumeration. Table E.5 shows the total meat consumed by farm households in each district in 2000 together with the amount of different types, with the districts listed in descending order of total consumption. The map shows the districts ranked according to the total meat consumed; the superimposed pie charts show the proportion of each type and indicate differences in the total consumption per district.

Both production and consumption were highest in Trashigang district, where about 48% of the total meat produced was consumed, followed by Mongar and Wangdue. Beef accounted for more than 80% of all meat consumed, and pork for about 13%. Paro and Chhukha districts were the major consumers of pork. Both mutton and chicken consumption were highest in Samtse followed by Tsirang and Dagana for mutton and Tsirang and Chhukha for chicken.

Table E.5

District	Total Consumption (kg)					District	Total Consumption (kg)				
	Beef	Pork	Mutton	Chicken	Total		Beef	Pork	Mutton	Chicken	Total
Trashigang	118,230	8,628	2,419	232	129,509	Paro	16,127	23,263	152	8	39,550
Mongar	104,137	6,468	535	270	111,410	Bumthang	36,590	0	470	78	37,138
Wangdue	76,000	9,403	1,222	93	86,718	Samtse	9,923	7,500	9,304	6,251	32,978
Punakha	54,869	8,576	0	106	63,551	Ha	20,959	8,612	121	71	29,763
Zhemgang	57,671	3,805	137	339	61,952	Thimphu	19,504	9,781	39	54	29,378
Yangtse	55,784	1,246	0	46	57,076	Pemagatshel	25,243	3,010	0	44	28,297
S/Jongkhar	45,141	4,682	132	441	50,396	Dagana	10,921	7,654	5,124	2,830	26,529
Lhuntse	47,080	1,338	1,011	109	49,538	Tsirang	4,180	7,571	5,965	4,593	22,309
Trongsa	47,889	741	168	172	48,970	Sarpang	10,962	2,157	1,561	1,803	16,483
Chhukha	17,465	16,303	3,887	2,793	40,448	Gasa	9,099	116	0	0	9,215
						Bhutan Total	787,774	130,854	32,247	20,333	971,208

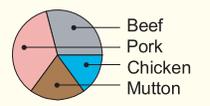


Consumption of Farm-Produced Meat

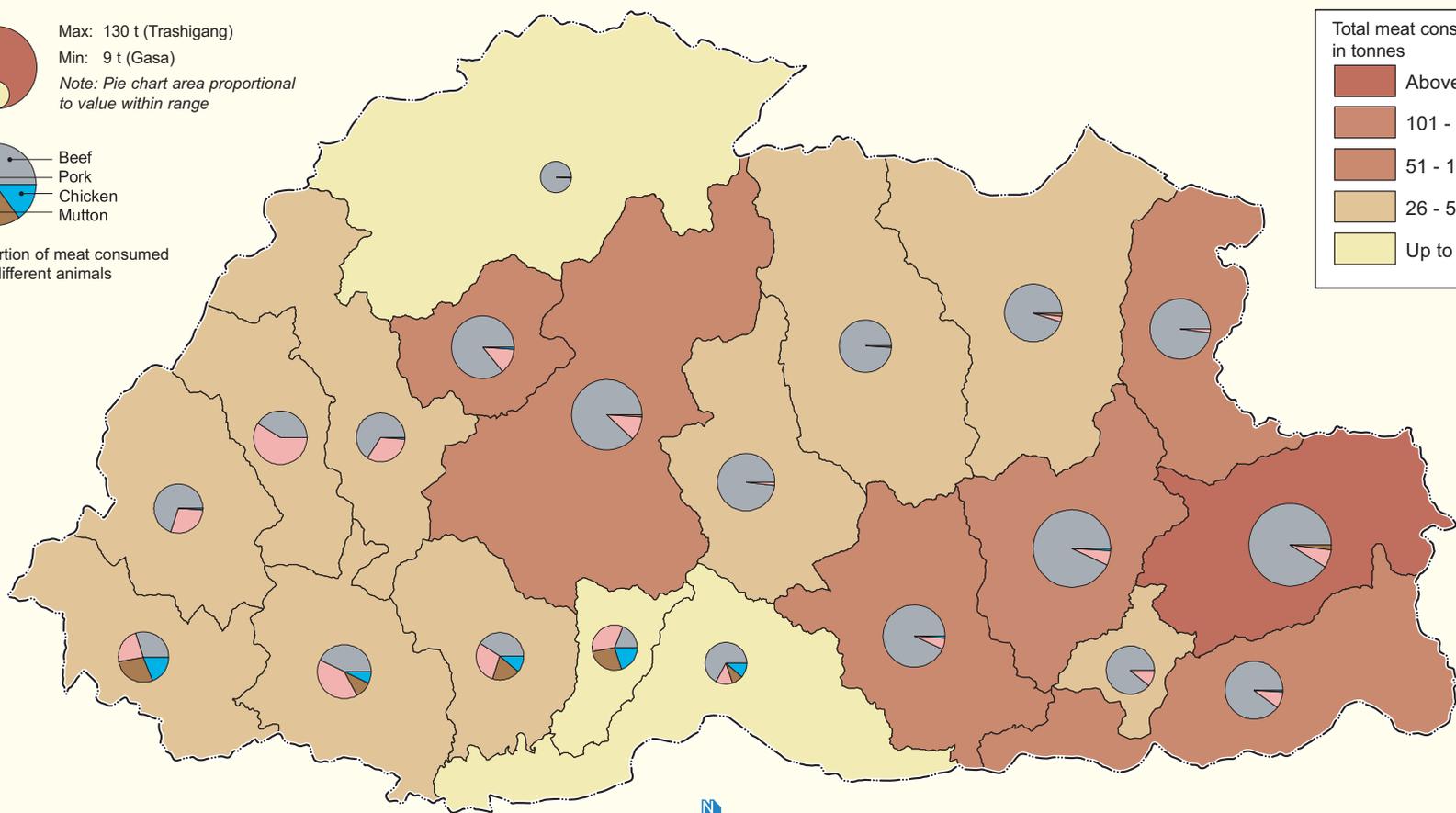
LEGEND



Max: 130 t (Trashigang)
 Min: 9 t (Gasa)
 Note: Pie chart area proportional to value within range



Proportion of meat consumed from different animals



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
 Ministry of Agriculture
 Data Source: RNR Statistics 2000, Ministry of Agriculture



Milk Availability and Production by Local, Jersey and Brown Swiss Cattle

There is a large difference in the production of milk among various breeds of cattle. The per head productivity of milk is estimated to be highest from Jersey cows, at approximately 852 litres annually, followed by Brown Swiss cows with 658 litres. Local cows give an average of only 393 litres annually.

Table E.6 shows the total annual milk production from each of the three types of cattle in 2000, together with the overall household availability (total production from all three types of cattle divided by number of farm households), listed in descending order of household availability. The milk availability from all sources is slightly higher (see Table E.3 for milk production from all sources). The map shows the districts ranked according to the total milk availability per household; the superimposed bar charts show the total annual milk production from each of the three types of cattle.

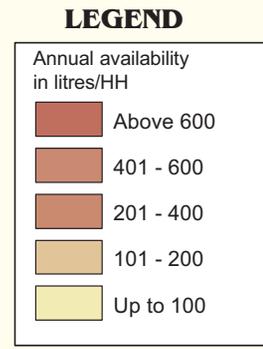
Although Jersey and Brown Swiss cows have a higher per head productivity of milk, the great majority of milk production is still from local cattle. Ha district had the highest average annual milk availability per farm household (836 litres) followed by Trongsa. Gasa had by far the lowest annual milk availability (75 litres).

Table E.6

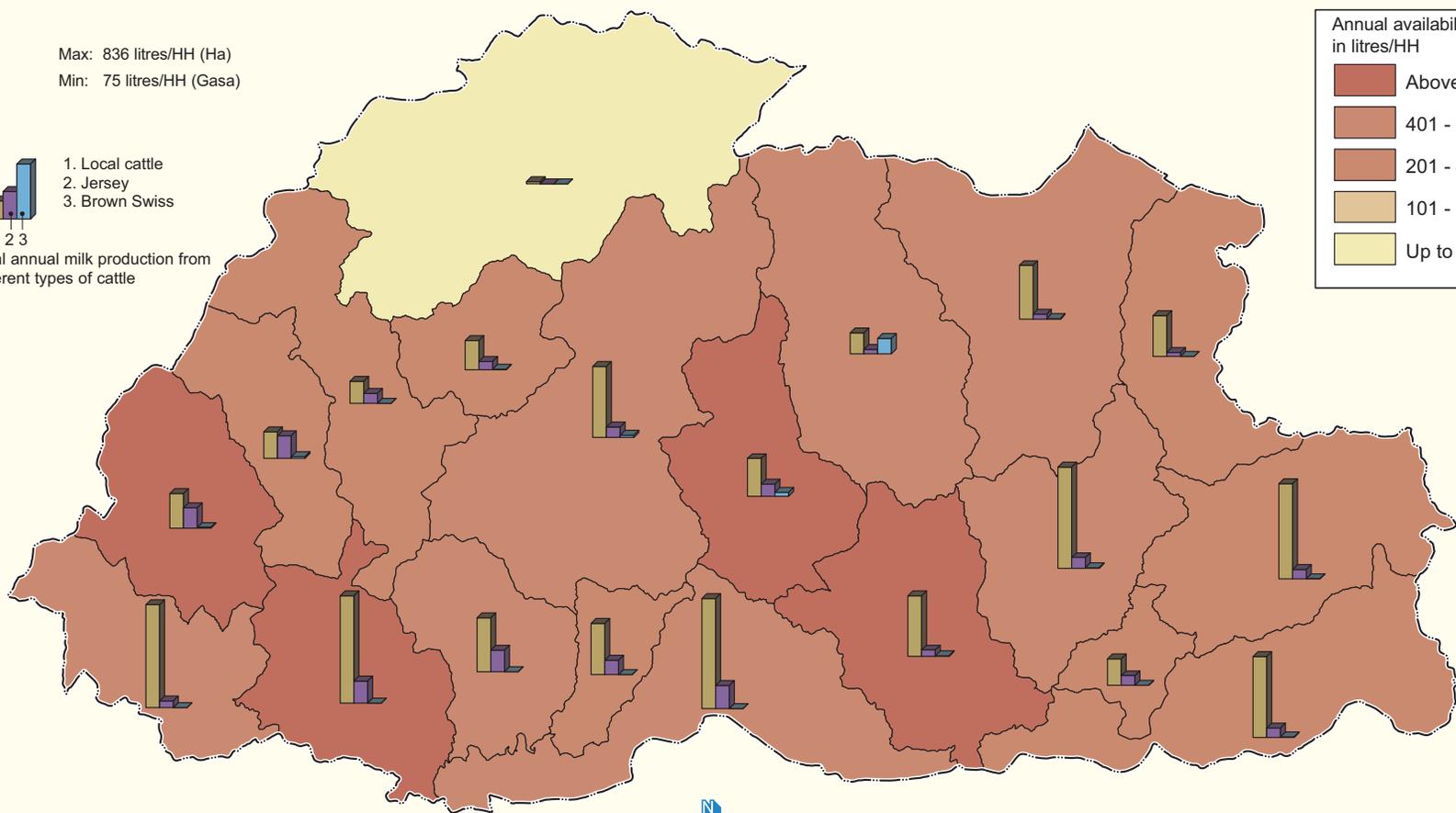
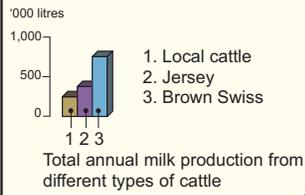
Districts	Annual Milk Production ('000 litres)			Total Annual Milk Availability* (litres per HH)	Districts	Annual Milk Production ('000 litres)			Total Annual Milk Availability (litres per HH)
	Local Cattle	Jersey	Brown Swiss			Local Cattle	Jersey	Brown Swiss	
Ha	573	340	15	836	Mongar	1,676	176	7	378
Trongsa	627	205	64	650	Tsirang	843	236	0	359
Zhemgang	1,004	102	4	632	Thimphu	364	164	3	338
Chhukha	1,776	368	4	624	Paro	443	373	30	317
Sarpang	1,823	385	>1	523	Punakha	484	142	16	301
Bumthang	349	75	260	493	S/Jongkhar	1341	156	4	300
Samtse	1,704	108	<1	491	Pemagatshel	444	164	5	230
Wangdue	1,172	176	39	479	Trashi Yangtse	672	59	0	222
Dagana	893	361	3	469	Trashigang	1,576	152	2	217
Lhuntse	892	87	14	428	Gasa	32	3	0	75
					Bhutan Total	18,688	3,832	472	8,362#

* average availability over all farm households, excluding milk from other animals; # Average milk availability; simple average, not weighted

Milk Availability and Production by Local, Jersey and Brown Swiss Cattle



Max: 836 litres/HH (Ha)
 Min: 75 litres/HH (Gasa)



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
 Ministry of Agriculture
 Data Source: RNR Statistics 2000, Ministry of Agriculture



Sources of Livestock Feed and Fodder

Various sources of livestock feed are used throughout Bhutan including tree fodder and crop residues, but the 2000 census surveyed only registered pasture, improved pasture, and fodder collection. The main source of fodder for the majority of livestock in Bhutan continues to be open grazing; Bhutan has about 430,000 acres of registered pasture land. Fodder is mainly collected for stall-fed animals, and in general only by households that have a small number of cattle and primarily for the calves.

Table E.7 shows the total livestock population (cattle, yak, equine, sheep, goats) in each district together with the area of registered and improved pasture and amount of fodder collected. The map shows the districts ranked according to the total registered pasture area. The superimposed bar charts show the area of improved pasture and headloads of fodder collected and the superimposed values the total number of livestock.

Improved pasture is still very limited at less than 1000 acres most of which is on specialised livestock farms. Improved pasture at the household level is very low. Trashigang district, with the highest number of livestock, had the greatest amount of registered pasture land; Gasa with the least number of livestock had the smallest amount of registered pasture land.

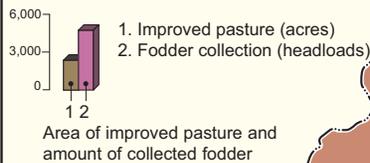
Table E.7

District	Registered Pasture (acres)	Improved Pasture (acres)	Fodder Collection (100 headloads)	Livestock* Population	District	Registered Pasture (acres)	Improved Pasture (acres)	Fodder Collection (100 headloads)	Livestock* Population
Bumthang	14,726	217	35	16,263	Samtse	7,543	228	9953	45,970
Chhukha	28,943	101	9595	32,720	Sarpang	138	22	3356	33,477
Dagana	1,706	5	3681	19,173	S/Jongkhar	100	2	3088	24,797
Gasa	5,123	8	206	5,758	Thimphu	75,303	42	466	16,758
Ha	13,632	117	1340	16,865	Trashigang	209,105	0	4122	48,370
Lhuntse	1,953	3	202	16,369	Trashi Yangtse	355	0	166	14,702
Mongar	907	17	2802	29,782	Trongsa	3,800	86	610	13,126
Paro	4,366	42	1256	16,570	Tsirang	100	6	3001	22,056
Pemagatshel	100	10	1594	9,604	Wangdue	48,025	38	974	29,794
Punakha	5,121	10	522	13,228	Zhemgang	7,335	14	564	13,953
					Bhutan Total	428,381	968	47,533	439,335

* Cattle, yak, equine, sheep, goats

Sources of Livestock Feed and Fodder

Max: 209,105 acres (Trashigang)
 Min: 100 acres (Paro, Jongkhar and Tsirang)

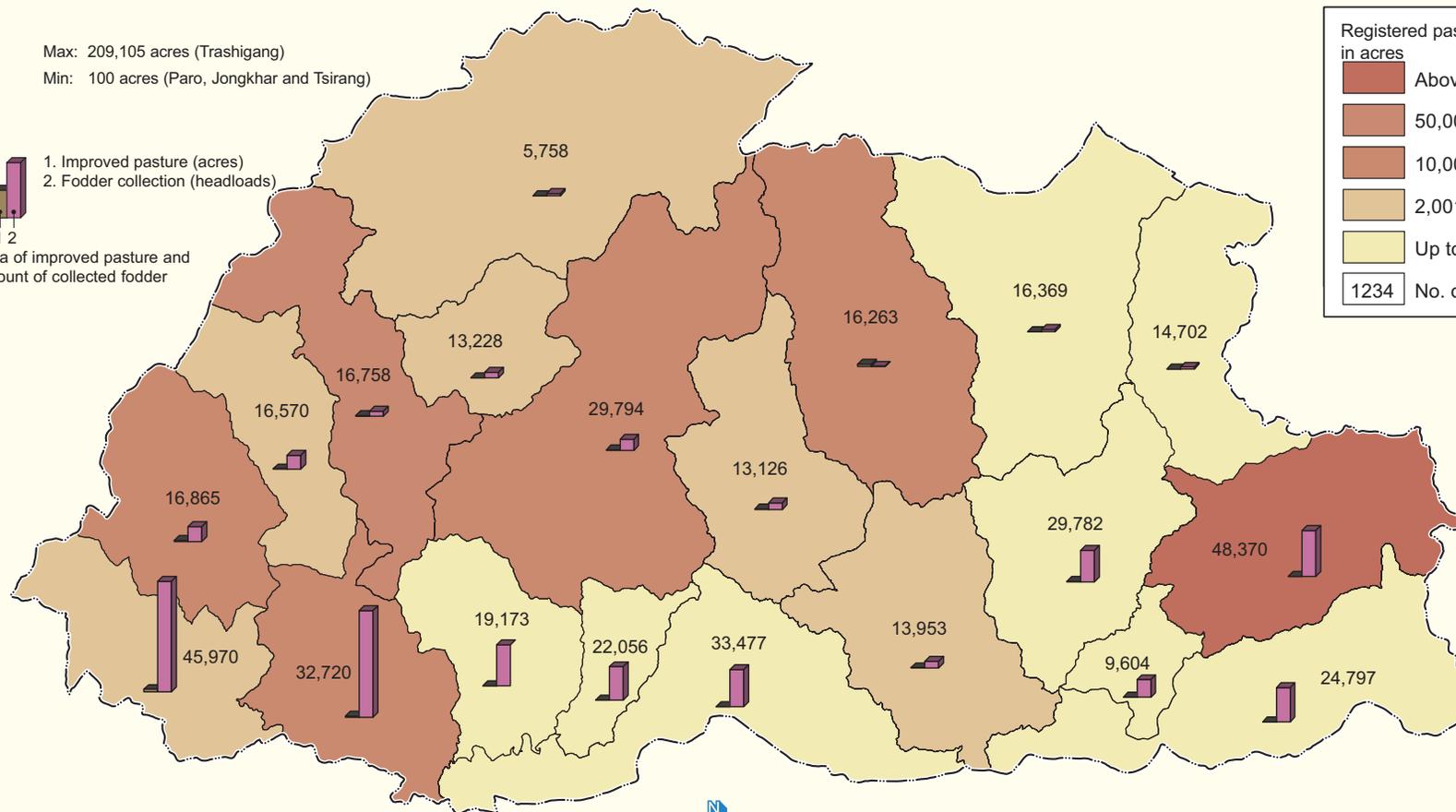


LEGEND

Registered pasture area in acres

- Above 100,000
- 50,001 - 100,000
- 10,001 - 50,000
- 2,001 - 10,000
- Up to 2,000

1234 No. of livestock



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
 Ministry of Agriculture
 Data Source: RNR Statistics 2000, Ministry of Agriculture



PPD, MOA



