

Review
**Livestock and poultry genetic resources of Manipur:
 status, distribution and types**

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ABSTRACT

Manipur is a small state in the North-Eastern region of India. Although the total livestock population of the Manipur constitutes only 0.136 percent of our country, the number of animals per household (1.48) is comparable to the national average (1.95). The number of backyard birds per household (5.16) is more than six times than the national average (0.83). Manipur is also home to Manipuri pony and Kaunayen chicken breeds. This article attempts to summarize the present status, distribution and attributes of livestock and poultry genetic resources of Manipur state.

Keywords: livestock, poultry, Animal Genetic Resources, Manipur, population

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INTRODUCTION

Manipur is a small state in the North-Eastern region of India situated between 23°83'N and 25°68'N latitude and 93°03'E and 94°78'E longitude having an area of 22347 square km. It is surrounded by Myanmar in the East and South, Assam and Mizoram in the West, and Nagaland in the North. Manipur is surrounded by hills with an oval shaped valley at the center. The temperature ranges from sub-zero to 32°C. The approximate average annual rainfall is 1,467.5 mm varying from 933 mm in Imphal to 2,593 mm in Tamenglong. The Manipur has 6.96 lakh livestock and 24.99 lakh poultry population (Livestock census 2012). The number of poultry per household is much higher than the rest of the country. It is home to some of the important livestock and poultry breeds of our country like Manipuri ponies and Kaunayen chicken, to name a few. This article attempts to evaluate the present status, distribution and characteristics of the livestock and poultry genetic resources of Manipur state.

Status and distribution of animal genetic resources of Manipur

Although the total livestock population (6.96 lakhs) of the Manipur constitutes only 0.136 percent of our country, the number of animals per household at 1.48 is comparable to the national average of 1.95 (Table 2). Further, though the poultry population of Manipur is only 0.343 percent of our country, the number of backyard birds per household are 5.16, which is more than six times than the national average of 0.83 (Table 7). The district wise and overall, status and distribution of various species of livestock and poultry genetic resources of the Manipur and attributes of breeds/populations available in the state are given below.

Livestock

The total livestock population of Manipur has declined from 7.88 lakh to 6.96 lakh between 2007 and 2012 showing a decline of 11.76 percent (Table 1) (Livestock census 2007, 2012). Senapati district has the largest livestock population (127240) followed by Thoubal (116401) and Churachandpur (91654) (Table 7 and 10). In terms of number of animals per 1000 households Tamenglong district (3925.4) has highest number followed by Chandel (2647.8) and Senapati (1958.9).

Cattle: The total cattle population (263843) of Manipur has shown a decline of 22.84 percent during 2007-2012, whereas, the indigenous cattle population (219536) has shown a decline of only 20.84 percent during this period. The 83.2 percent of the cattle population of Manipur is of the indigenous type. Chandel district has the highest percentage (98.6) and Bishnupur district has the lowest percentage (67.3) of indigenous cattle (Table 1 and 3). Although the Thoubal district has the largest cattle population (48428), the maximum population of indigenous cattle is in the Senapati district (43277). In terms of number of cattle per 1000 households, Tamenglong (1024.7) and Chandel (982.5) districts have the highest number for total and indigenous cattle, respectively (Table 9).

Buffalo: The buffalo population (66369) of Manipur has shown an increase of 6.76 percent between 2007 and 2012. Senapati district (33.9%) possesses the maximum buffalo population of the state followed by Ukhrul (20.9%) and Tamenglong (17.2%). More than 70 percent of the buffalo population of the Manipur is located in these three Northern districts. In terms of number of buffaloes per 1000 households, Tamenglong district (626.2) has the

maximum number followed by Ukhrul (408.2) and Senapati (346.7) (Table 3 and 9).

Mithun: The total mithun population of Manipur is 10131. It has shown a marginal increase of 3.4 percent between 2007 and 2012. Chandel district (51%) has the largest population of Mithuns of the state followed by Tamenglong (16.7%) and Churachandpur (13.5%). More than 99 percent population of mithuns is located in the five districts of Chandel, Tamenglong, Churachandpur, Senapati and Ukhrul. In terms of number of animals per 1000 households Chandel district (231.2) has the highest number followed by Tamenglong (92.9) and Churachandpur (26.1) (Table 3 and 9).

Sheep: The total sheep population of Manipur is mere 11463 and it has shown an increase of 31.82 percent during 2007-2012. However, the indigenous sheep, which are 65.55 percent of the total sheep population, have shown a decrease of 8.42 percent during this period. Imphal West district has the highest percentage (99.27)

and Tamenglong district has the lowest percentage (14.10) of indigenous sheep among the total sheep of the district. Bishnupur district have no indigenous sheep (Table 1 and 4). The Senapati district has the largest population of total (4566) as well as indigenous (3013) sheep. In terms of number of sheep per 1000 households, Tamenglong (115.7) and Senapati (46.4) districts have highest number for total and indigenous sheep, respectively (Table 9).

Horses and other equines: The total horse population of Manipur is only 1101 and it has shown a decrease of 9.61 percent between 2007 and 2012. Tamenglong district (416) holds the largest population of horses and ponies followed by Thoubal (209) and Churachandpur (198). In terms of number of animals per 1000 households, Tamenglong district (22.9) has the highest number followed by Chandel (7.6) and Churachandpur (3.8) (Table 6 and 9). The populations of donkeys and mules in Manipur are only 126 and 366, respectively.

Table 1: Percent increase or decrease in the population of different livestock and poultry species during 2007-2012 in the state of Manipur

Species	Population		Percent change between 2003-2012
	2007	2012	
Total cattle	341956	263843	-22.84
Indigenous cattle	276262	219536	-20.53
Buffalo	62167	66369	6.76
Mithun	10024	10131	1.07
Total sheep	8696	11463	31.82
Indigenous sheep	8205	7514	-8.42
Goat	50577	65158	28.83
Total pigs	313882	277215	-11.68
Indigenous pigs	141307	94669	-33.00
Horses (Ponies)	1218 (1037)	1101	-9.61
Donkeys	0	126	-
Mules	0	366	-
Total livestock	788520	695772	-11.76
Total backyard fowls	1733950	1851109	6.76
Indigenous backyard fowls	1181479	1044251	-11.61
Total backyard ducks	555117	551433	-0.66
Indigenous backyard ducks	307055	277317	-9.68
Other backyard birds#	15172	19778	30.36
Total backyard poultry	2304239	2422320	5.12
Poultry in farms (all)	99093	77196	-22.10
Total poultry	2403332	2499516	4.00

#Turkeys, quails, Emus etc.

Table 2: Total livestock population and animals per 1000 households in different districts of Manipur

District	Livestock population	Households	Animals per 1000 households
Bishnupur	40176	45636	880.4
Chandel	59219	22365	2647.8
Churachandpur	91654	52267	1753.6
Imphal-East	75993	68427	1110.6
Imphal-West	49276	81899	601.7
Senapati	127240	64956	1958.9
Tamenglong	71462	18205	3925.4
Thoubal	116401	82116	1417.5
Ukhrul	64351	33989	1893.3
Total/overall	695772	469860	1480.8

Table 3: Total population and animals per 1000 households of bovine species in different districts of Manipur

Districts	Cattle				Buffalo		Mithun	
	Total cattle		Indigenous cattle		Population	Animals per 1000 households	Population	Animals per 1000 households
	Population	Animals per 1000 households	Population	Animals per 1000 households				
Bishnupur	23147	507.2	15585	341.5	976	21.4	0	0.0
Chandel	22277	996.1	21973	982.5	5005	223.8	5170	231.2
Churachandpur	28657	548.3	26333	503.8	6528	124.9	1366	26.1
Imphal-East	29845	436.2	23457	342.8	3309	48.4	20	0.3
Imphal-West	23095	282.0	18412	224.8	867	10.6	0	0.0
Senapati	46867	721.5	43277	666.3	22523	346.7	1119	17.2
Tamenglong	18654	1024.7	16414	901.6	11400	626.2	1692	92.9
Thoubal	48428	589.8	35135	427.9	1886	23.0	5	0.1
Ukhrul	22873	673.0	18950	557.5	13875	408.2	759	22.3
Total/ overall	263843	561.5	219536	467.2	66369	141.3	10131	21.6

Table 4: Total population and animals per 1000 households of small ruminants in different districts of Manipur

Districts	Sheep				Goat	
	Total sheep		Indigenous sheep		Population	Animals per 1000 households
	Population	Animals per 1000 households	Population	Animals per 1000 households		
Bishnupur	0	0.0	0	0.0	1008	22.1
Chandel	375	16.8	264	11.8	4151	185.6
Churachandpur	852	16.3	752	14.4	14278	273.2
Imphal-East	1075	15.7	807	11.8	10643	155.5
Imphal-West	1230	15.0	1221	14.9	2570	31.4
Senapati	4566	70.3	3013	46.4	7985	122.9
Tamenglong	2107	115.7	297	16.3	11899	653.6
Thoubal	1109	13.5	1016	12.4	9782	119.1
Ukhrul	149	4.4	144	4.2	2842	83.6
Total/ overall	11463	24.4	7514	16.0	65158	138.7

Table 5: Total population and animals per 1000 households of pigs in different districts of Manipur

Districts	Total pigs		Indigenous pigs	
	Population	Animals per 1000 households	Population	Animals per 1000 households
Bishnupur	15045	329.7	64	1.4
Chandel	21861	977.5	5308	237.3
Churachandpur	39775	761.0	15237	291.5
Imphal-East	31096	454.4	14632	213.8
Imphal-West	21465	262.1	7445	90.9
Senapati	44139	679.5	18478	284.5
Tamenglong	25104	1379.0	9104	500.1
Thoubal	54982	669.6	11594	141.2
Ukhrul	23748	698.7	12807	376.8
Total/overall	277215	590.0	94669	201.5

Table 6: Total population and animals per 1000 households of horses in different districts of Manipur

Districts	Population	Animals per 1000 households
Bishnupur	0	0.0
Chandel	169	7.6
Churachandpur	198	3.8
Imphal-East	5	0.1
Imphal-West	49	0.6
Senapati	27	0.4
Tamenglong	416	22.9
Thoubal	209	2.5
Ukhrul	28	0.8
Total/overall	1101	2.3

Table 7: Total population and birds per 1000 households of poultry in different districts of Manipur

District	Total poultry	Poultry in Backyard system	Birds per 1000 households (Backyard)
Bishnupur	215539	215539	4723.0
Chandel	160304	160304	7167.6
Churachandpur	129899	128301	2454.7
Imphal-East	442022	423190	6184.5
Imphal-West	344783	288203	3519.0
Senapati	260537	260351	4008.1
Tamenglong	130024	130024	7142.2
Thoubal	608829	608829	7414.3
Ukhrul	207579	207579	6107.2
Total/ overall	2499516	2422320	5155.4

Poultry

The total poultry population of Manipur is 24.99 lakhs. About 97 percent of the poultry population in Manipur is reared in the backyard system as compared to national average of only 29.8 percent. Thoubal district has the largest number of backyard poultry (608829) followed by Imphal East (423190) and Imphal West (288203) (Table 7 and 10). In terms of number of birds per 1000 households, Thoubal district (7414.3) has highest number followed by Chandel (7167.6) and Tamenglong (7142.2).

Fowls: The total backyard fowl population of Manipur is 1851109 and it has shown an increase of 6.76 percent between 2007 and 2012. However, during this period, the population of indigenous backyard fowls, which are 56.4 percent of the total backyard fowls of the state, have shown a decline of 11.6 percent. Senapati district has the highest percentage (78.2) and Imphal West district has the lowest percentage (32.0) of indigenous backyard fowls (Table 1 and 8). The total population of backyard fowls is highest in the Thoubal district (403935) followed by Imphal East (313763) and Senapati (215828) districts. However, the largest population of indigenous backyard fowls is in the Thoubal district (179882) followed by Senapati (168682) and Imphal East (159719). In terms of number of backyard fowls per 1000 households, Tamenglong district has highest number of total (6363.0) as well as indigenous (4868.7) fowls (Table 10).

Ducks: Despite having only 0.68 percent of the total area of our country, Manipur holds 2.99 percent of the total duck population of our country. The total backyard duck population of Manipur is 551433 and it has shown a marginal decrease of 0.66 percent during 2007-2012. However, during this period, the population of indigenous backyard ducks (277317), which are 50.3 percent of the total backyard ducks of the state, have shown a decline of 9.7 percent during this period. Ukhrul district has the highest percentage (91.0) and Chandel district has the lowest percentage (38.8) of indigenous backyard ducks (Table 1 and 8). The total population of backyard ducks is highest in the Thoubal district (195560) followed by Imphal East (104837) and Bishnupur (78326). The maximum population of indigenous backyard Ducks is also in the Thoubal district (80511) followed by Imphal East (54236) and Bishnupur (47737). In terms of number of backyard ducks per 1000 households, Thoubal (2381.5) and Bishnupur (1046.0) districts has maximum number of total and indigenous ducks (Table 10).

Other poultry species: The total population of other backyard poultry species of Manipur is 19778 and it has shown an increase of 30.36 percent between 2007 and 2012. These include turkeys (38.0%), quails (6.9%) and other minor species (55.1%) like emu etc. Thoubal district has the maximum percentage (47.2) and Chandel and Churachandpur districts has the minimum

Table 8: Total population and birds per 1000 households of fowls, ducks and other poultry species in backyard system in different districts of Manipur

Districts	Fowls				Ducks				Other birds (Turkeys, quails, emus etc.)	
	Total		Indigenous		Total		Indigenous		Popula- tion	Birds per 1000
	Popula- tion	Birds per 1000 house- holds	Popula- tion	Birds per 1000 house- holds	Popula- tion	Birds per 1000 house- holds	Popula- tion	Birds per 1000 house- holds		
Bishnupur	136008	2980.3	64249	1407.9	78326	1716.3	47737	1046.0	1205	26.4
Chandel	137081	6129.3	87834	3927.3	23177	1036.3	8983	401.7	46	2.1
Churachandpur	118189	2261.3	77128	1475.7	10059	192.5	8757	167.5	53	1.0
Imphal-East	313763	4585.4	159719	2334.2	104837	1532.1	54236	792.6	4590	67.1
Imphal-West	209391	2556.7	67000	818.1	76654	936.0	37122	453.3	2158	26.3
Senapati	215828	3322.7	168682	2596.9	42641	656.5	23022	354.4	1882	29.0
Tamenglong	115839	6363.0	88634	4868.7	14014	769.8	11337	622.7	171	9.4
Thoubal	403935	4919.1	179882	2190.6	195560	2381.5	80511	980.5	9334	113.7
Ukhrul	201075	5915.9	151123	4446.2	6165	181.4	5612	165.1	339	10.0
Total/overall	1851109	3939.7	1044251	2222.5	551433	1173.6	277317	590.2	19778	42.1

percentage (0.2 and 0.3) of other backyard poultry population of the state (Table 1 and 8).

The total population of other backyard poultry is maximum in the Thoubal district (9334) followed by

Imphal East (4590) and Imphal West (2158). In terms of number of other backyard birds per 1000 households, Thoubal district has highest number (113.7) followed by Imphal East (67.1) and Senapati (29.0). (Table 10).

Table 9: Districts with maximum population and animals per 1000 households of different livestock species in Manipur

Species	Total population	Animals per 1000 households
Total cattle	Thoubal (48428*, 18.4#), Senapati (46867, 17.8), Imphal-East (29845, 11.3), Churachandpur (28657, 10.9), Bishnupur (23147, 8.8)	Tamenglong (1024.7\$), Chandel (996.1), Senapati (721.5), Ukhrul (673.0), Thoubal (589.8)
Indigenous cattle	Senapati (43277, 19.7), Thoubal (35135, 16.0), Churachandpur (26333, 12.0), Imphal-East (23457, 10.7), Chandel (21973, 10.0)	Chandel (982.5), Tamenglong (901.6), Senapati (666.3), Ukhrul (557.5), Churachandpur (503.8)
Buffalo	Senapati (22523, 33.9), Ukhrul (13875, 20.9), Tamenglong (11400, 17.2), Churachandpur (6528, 9.8), Chandel (5005, 7.5)	Tamenglong (626.2), Ukhrul (408.2), Senapati (346.7), Chandel (223.8), Churachandpur (124.9)
Mithun	Chandel (5170, 51.0), Tamenglong (1692, 16.7), Churachandpur (1366, 13.5), Senapati (1119, 11.0), Ukhrul (759, 7.5)	Chandel (231.2), Tamenglong (92.9), Churachandpur (26.1), Ukhrul (22.3), Senapati (17.2)
Total sheep	Senapati (4566, 39.8), Tamenglong (2107, 18.4), Imphal-West (1230, 10.7), Thoubal (1109, 9.7), Imphal-East (1075, 9.4)	Tamenglong (115.7), Senapati (70.3), Chandel (16.8), Churachandpur (16.3), Imphal-East (15.7)
Indigenous sheep	Senapati (3013, 40.1), Imphal-West (1221, 16.2), Thoubal (1016, 13.5), Imphal-East (807, 10.7), Churachandpur (752, 10.0)	Senapati (46.4), Tamenglong (16.3), Imphal-West (14.9), Churachandpur (14.4), Thoubal (12.4)
Goat	Churachandpur (14278, 21.9), Tamenglong (11899, 18.3), Imphal-East (10643, 16.3), Thoubal (9782, 15.0), Senapati (7985, 12.3)	Tamenglong (653.6), Churachandpur (273.2), Chandel (185.6), Imphal-East (155.5), Senapati (122.9)
Total pigs	Thoubal (54982, 19.8), Senapati (44139, 15.9), Churachandpur (39775, 14.3), Imphal-East (31096, 11.2), Tamenglong (25104, 9.1)	Tamenglong (1379.0), Chandel (977.5), Churachandpur (761.0), Ukhrul (698.7), Senapati (679.5)
Indigenous pigs	Senapati (18478, 19.5), Churachandpur (15237, 16.1), Imphal-East (14632, 15.5), Ukhrul (12807, 13.5), Thoubal (11594, 12.2)	Tamenglong (500.1), Ukhrul (376.8), Churachandpur (291.5), Senapati (284.5), Chandel (237.3)
Horses	Tamenglong (416, 37.8), Thoubal (209, 19.0), Churachandpur (198, 18.0), Chandel (169, 15.3), Imphal-West (49, 4.5)	Tamenglong (22.9), Chandel (7.6), Churachandpur (3.8), Thoubal (2.50), Ukhrul (0.8)
Total livestock	Senapati (127240, 18.3), Thoubal (116401, 16.7), Churachandpur (91654, 13.2), Imphal-East (75993, 10.9), Tamenglong (71462, 10.3)	Tamenglong (3925.4), Chandel (2647.8), Senapati (1958.9), Ukhrul (1893.3), Churachandpur (1753.6)

Values in parenthesis are *total population, # percent of state population, \$animals per 1000 households, for that district and species

Table 10: Districts with maximum population and birds per 1000 households of different species of poultry in Manipur

Species	Total population	Birds per 1000 households
Total fowls	Thoubal (4039358*, 21.8#), Imphal-East (313763, 17.0), Senapati (215828, 11.7), Imphal-West (209391, 11.3), Ukhrul (201075, 9)	Tamenglong (6363.0\$), Chandel (6129.3), Ukhrul (5915.9), Thoubal (4919.1), Imphal-East (4585.4)
Indigenous fowls	Thoubal (179882, 17.2), Senapati (168682, 16.2), Imphal-East (159719, 15.3), Ukhrul (151123, 14.5), Tamenglong (88634, 8.5)	Tamenglong (4868.7), Ukhrul (4446.2), Chandel (3927.3), Senapati (2596.9), Imphal-East (2334.2)
Total ducks	Thoubal (195560, 35.5), Imphal-East (104837, 19.0), Bishnupur (78326, 14.2), Imphal-West (76654, 13.9), Senapati (42641, 7.7)	Thoubal (2381.5), Bishnupur (1716.3), Imphal-East (1532.1), Chandel (1036.3), Imphal-West (936.0)
Indigenous ducks	Thoubal (80511, 29.0), Imphal-East (54236, 19.6), Bishnupur (47737, 17.2), Imphal-West (37122, 13.4), Senapati (23022, 8.3)	Bishnupur (1046.0), Thoubal (980.5), Imphal-East (792.6), Tamenglong (622.7), Imphal-West (453.3)
Other backyard poultry (Turkey, quails, emus etc.)	Thoubal (9334, 47.2), Imphal-East (4590, 23.2), Imphal-West (2158, 10.9), Senapati (1882, 9.5), Bishnupur (1205, 6.1)	Thoubal (113.7), Imphal-East (67.1), Senapati (29.0), Bishnupur (26.4), Imphal-West (26.3)
Total backyard birds	Thoubal (608829, 25.1), Imphal-East (423190, 17.5), Imphal-West (288203, 11.9), Senapati (260351, 10.7), Bishnupur (215539, 8.9)	Thoubal (7414.3), Chandel (7167.6), Tamenglong (7142.2), Imphal-East (6184.5), Ukhrul (6107.2)
Total birds (Backyard + poultry farms)	Thoubal (608829, 24.4), Imphal-East (442022, 17.7), Imphal-West (344783, 13.8), Senapati (260537, 10.4), Bishnupur (215539, 8.6)	-

Values in parenthesis are *total population, #percent of state population, \$birds per 1000 households, for that district and species

Characteristics of livestock and poultry breeds/types of the Manipur

Manipuri cattle

The coat colour of Manipuri cattle is brown in majority of the animals (76%) followed by small percentage of black (12%), grey (4%) and spotted (8%) animals. Bulls had medium hump. Horns are small, black (82%) or grey (18%). Udder is small and milk veins is not prominent. Temperament is docile. The body length, height at wither and heart girth of these cattle are 100.32±0.59, 106.22±0.51 and 137.69±0.78 cm in males and 98.92±1.53, 104.56±1.64 and 132.80±2.61 cm in females, respectively. Cows and bulls do not differ significantly in any of the morphometric traits. The average daily milk yield is 2.65±0.18 kg (2.0 to 4.5 kg). Animals showed uniformity in physical and morphometric traits (Pundir *et al.* 2015).

Manipuri buffaloes

Based on the habitat, Manipuri buffaloes are locally classified into two types, viz. '*Tamgi-eroi*' or hill type, distributed in Chandel, Churachandpur, Ukhrul, Senapati

and Tamenglong districts and '*Chingi-eroi*' or valley type, distributed in Imphal East, Imphal West, Bishnupur and Thoubal districts of the state. Both males and females are used for ploughing. Mostly, single animal is employed for this purpose. These buffaloes can walk and climb easily in the hilly terrain, where they are employed to pull logs of wood. The average body length, height at wither and heart girth of these buffaloes are 122.68±2.09, 124.16±1.07 and 199.26±1.82 cm in hill type and 129.53±1.75, 133.69±1.00 and 188.95±2.27 cm in valley type animals, respectively (Mishra *et al.* 2010). Manipuri buffaloes are reared mainly for draught and meat purposes.

These buffaloes have 48 chromosomes, which is typical of swamp type buffaloes. In phylogenetic analysis also, conducted using 15 microsatellite loci, the Manipuri buffaloes clustered with other swamp type buffaloes of north-Eastern region (Nagaland, Lower Assam and Mizoram) separate from the riverine types (Murrah, Marathwadi and Toda). Comparison of mitochondrial D-loop sequence of these buffaloes with representative riverine and swamp type buffaloes also endorsed that

these buffaloes are of the swamp type (Mishra *et al.* 2010, Mishra *et al.* 2015). Manipuri buffaloes have been registered as new breed of indigenous swamp buffaloes as Luit buffaloes along with the swamp buffaloes of Assam.

Manipuri mithun

Like other North-Eastern states mithun in Manipur is primarily reared as meat animal and used for holy sacrifices. The average body length, height at withers and heart girth of Manipuri mithun are 140.01 ± 4.19 , 103.67 ± 2.58 and 135.51 ± 3.24 cm (Mukherjee *et al.* 2014). Earlier, Mondal *et al.* (2004) had reported body length, height at withers and heart girth of 127.38, 121.43 and 171.30 for these mithuns. Although, the mithun is used mainly for meat purpose, Bhushan *et al.* (2005) assessed the milk production potential and reported the first lactation length, second lactation length, first lactation dry period, second lactation dry period, first lactation peak yield, second lactation peak yield and average milk production per day for Manipuri mithuns to be 177.00 \pm 47.62 days, 170.56 \pm 20.46 days, 166.00 \pm 53.44 days, 147.0 \pm 23.90 days, 1825.00 \pm 159.46 g, 1920.57 \pm 107.23 g and 1293.50 \pm 128.88 g, respectively.

Manipuri ponies

Manipur is also home to the Manipuri ponies which are referred to as original polo ponies. These are small sized ponies having body length, height at withers and heart girth of 129.57 \pm 1.21, 129.04 \pm 0.88 and 143.57 \pm 1.54 cm. The ear length is 14.87 \pm 0.18 cm. The face length and face width are 58.18 \pm 0.55 and 20.20 \pm 0.20 (Gupta *et al.* 2012). In a genetic study conducted by using a set of 25 microsatellite loci Manipuri ponies first clustered with other pony breeds of India separate from the Marwari horses (Behl *et al.* 2007).

Manipuri pigs

Naskar *et al.* (2013) has described some broad characteristics of Manipuri local pigs sometimes also referred as Burmese pigs by the local population. Ears are large in size and drooping type. They are medium sized pigs with an adult weight of 120-150 kg. Litter size is about 8 to 12.

Kaunayen chicken

Kaunayen chickens reared in the Imphal valley has been registered as the 17th chicken breed of India. They are reared in the backyard system mainly for cock fighting. These birds have elongated body with long neck and long legs. Broodiness is usual. Plumage colour is black or brown and pattern is generally patchy in males and solid in females. Cocks generally have shining bluish black feathers on wings, breast, tail and thighs. Neck, breast and thighs are generally bare, hard and rosered coloured in fighting cocks. Comb is red in colour and is of peat type. The body weight of an adult cock is

3.01 ± 0.06 kg and that of an adult hen is 2.32 ± 0.09 kg. A Kaunayen hen lays about 35 eggs per annum. Eggs are medium in size with an average weight of 42.43 ± 0.7 g. Shell colour is brown. Albumen index, yolk index and haugh units are 0.07 ± 0.01 , 0.38 ± 0.01 , 76.88 ± 2.35 respectively. Morphologically, Kaunayen look similar to Danki and Aseel breeds but is native to the area (Manipur) which is far apart and geographically isolated from the breeding tract of Danki (Andhra Pradesh) and Aseel (Andhra Pradesh, Orissa and Chhattisgarh). Over the centuries, these have adapted to the local conditions and hence can be classified as a different population of fighter birds (Vijeta *et al.* 2016). The genotypic data generated on 24 microsatellite markers also established distinctness of Kaunayen chicken from other registered poultry breeds of India (Sharma *et al.* 2017).

CONCLUSION

In conclusion, we can say that despite its small size Manipuri is home to some of the magnificent animal genetic resources of our country. However, during recent past the population of the majority of the species of livestock and poultry genetic resources of Manipur has shown a decline and requires conservation efforts to arrest this decline.

REFERENCES

- Behl R, Behl J, Gupta N and Gupta S C. 2007. Genetic relationships of five Indian horse breeds using microsatellite markers. *Animal* 1:483-8.
- Bhusan S, Rajkhowa C and Bujarbaruah K M. 2005. Productive traits of mithun (*Bos frontalis*) and their correlations. *Indian Journal of Animal Sciences* 75: 971-3.
- Gupta AK, Tandon SN, Pal Y, Bhardwaj A and Chauhan M. 2012. Phenotypic characterization of Indian equine breeds: a comparative study. *Animal Genetic Resources (FAO)* 50:49-58.
- Livestock census. 2003. 17th Livestock census - 2003, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture.
- Livestock census. 2012. 19th Livestock census - 2012, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture.
- Mishra BP, Dubey PK, Prakash B, Kathiravan P, Goyal S, Sadana D K, Das G C, Goswami R N, Bhasin V, Joshi B K and Kataria R S. 2015. Genetic analysis of river, swamp and hybrid buffaloes of North-eastern India throw new light on phylogeography of water buffalo (*Bubalus bubalis*). *Journal of Animal Breeding and Genetics* 132:454-66.
- Mishra B P, Prakash B, Kataria R S, Kathiravan P, Sadana D K, Das G C, Joshi B K, Bhasin V, Rasool T J and Bujarbaruah K M. 2010. Cytogenetic profiling and

- mitochondrial DNA analysis reveal existence of swamp buffalo population in Manipur state. *Indian Journal of Animal Sciences* 80:31–6.
- Mondal S K, Bujarbaruah K M, Khate K and Borah I P. 2004. Body conformation traits in mithun (*Bos frontalis*) *Indian Journal of Animal Sciences* 74: 84-7.
- Mukherjee M, Mukherjee A, Longkumer I, Mech M, Khate K, Perumal P and Rajkhowa C. 2014. Morphometric characterization of Indian mithuns. *Indian Journal of Animal Sciences* 84: 699–702.
- Naskar S, Niranjana S K and Banik S. 2013. Utilization of pig genetic resources in India. In: Sustainable utilization of Indigenous Animal Genetic Resources. Editors: RK Pundir, SK Niranjana and R Behl. NBAGR, Karnal publication. Pp 120-5.
- Pundir R K, Singh P K, Dangi P S, Kumar A, Singh N B, Singh P K and Sadana D K. 2015. Indigenous cattle of Manipur— Characterization and performance evaluation. *Indian Journal of Animal Sciences* 85: 382–5.
- Sharma R, Sharma P, Ahlawat A, Th Singh R, Vij P K, Viji R K and Tandia M S. 2017. Genetic variability and phylogenetic relationship establishes distinctness of Kaunayen chicken of Manipur. *Indian Journal of Animal Sciences* 87: 871–8.
- Vij P K, Tandia M S and Th Singh R. 2016. Kaunayen chicken – a new indigenous germplasm from Manipur. *Indian Journal of Animal Sciences* 86: 1085–7.