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Evaluation of *Mewari,* a native chicken breed *vis-à-vis Pratapdhan,* an improved chicken variety under an intensive system of rearing

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ABSTRACT

Mewari is an indigenous chicken breed and *Pratapdhan* is a dual purpose chicken variety developed using *Mewari*, coloured broiler and Rhode Island Red. *Pratapdhan* birds were well accepted by the farmers of Rajasthan and adjoining areas. The study was undertaken for comparative evaluation of *Mewari* and *Pratapdhan* chicken under intensive system. The data were analyzed using factorial design with genotype, sex and generation (2 × 2 × 3) as main effects. The body weights differed significantly at all ages with significant higher weights in *Pratapdhan* as compared to *Mewari* chicken. Sex had significant effect on body weights at all ages except at 2nd week. Males had significantly higher body weights across the genotypes and generations. The interaction effects were significant between the genotypes, sex and generations, except at 2nd week of age. The body weights showed an increasing trend over the generations with few exceptions. ASM and egg weights significantly varied between the genotypes and across the generations with significant interaction effects. The average annual egg production and egg weight (72 weeks) in *Mewari* and *Pratapdhan* chicken were 92.02±0.52 and 158.25±1.20 and 46.85±0.22 and 55.74±0.28, respectively. The fertility per cent was 80.39±1.45 and 83.28±0.64 in *Mewari* and *Pratapdhan*, respectively. The results suggest that *Pratapdhan* could be one of the potential improved germplasm for backyard poultry production.

Keywords: Body weight, Egg production, Egg weight, Hatchability

Rural poultry farming with high yielding chicken varieties has been the proven technology for livelihood and nutritional security among rural and tribal areas of the country (Rajkumar and Rama Rao 2015). Backyard poultry has shown a quantum jump with 46% increase in population in 2019 (BAHS 2019) due to the promotion of improved chicken varieties for increased productivity. Backyard poultry contribute about 17% to the total egg production and chicken contribute up to 50% of the total meat production. In spite of very good production of poultry produce, the availability of chicken products is far below the recommended levels of 180 eggs and 11 kg meat, the scenario is still worse in rural areas. The per capita availability of eggs and chicken meat is about 86 eggs and 3.26 kg chicken meat per annum.

Backyard poultry considered as a less expensive activity for households to generate highly nutritious egg and meat at minimal cost (Pica-Ciamarra and Otte 2010). The requirements for backyard poultry are birds having desirable plumage colour with high performance compared to local indigenous birds with very little change in husbandry practices. In addition to indigenous fowl, crossbreds, produced using exotic breeds are being utilized for backyard poultry farming (Khan 2008, Padhi*et al.* 2012a, 2016, Rajkumar *et al*. 2018, 2019). Higher shank length with moderate body weight helps the birds to run faster, thus protecting themselves from the predator. Backyard chickens are excellent transformers of low value natural food base in to highly nutritious animal protein, i.e. egg and meat (Rajkumar *et al.* 2010). The basic advantage of backyard poultry is that mostly the activity has been managed by women in the family leading to women empowerment (Rajkumar *et al.* 2010, Sambo *et al.* 2015, Rajkumar and Rama Rao 2015). Indigenous breeds are well known for their tropical adaptability and disease resistance, while their plumage colour helps in protecting themselves against predators. The local native germplasm of Southern Rajasthan has been registered as *Mewari* chicken. *Pratapdhan*, a dual purpose chicken variety developed for rural poultry production at MPUAT, Udaipur is promoted in Rajasthan.

In the present study, the performance of the *Mewari*, a native indigenous breed and *Pratapdhan*, an established dual purpose rural chicken variety was studied for their growth and production traits.

MATERIALS AND METHODS

The research work was carried out under ICAR-AICRP

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on Poultry Breeding Project at Poultry Farm, Department of Animal Production, Rajasthan College of Agriculture, Udaipur, Rajasthan.

Experimental population: A total of 4,867 chicks of *Mewari* (3,232) and *Pratapdhan* (1,635) populations produced in three generations at ICAR-AICRP on Poultry Breeding Experimental Poultry Farm, Department of Animal Production, Rajasthan College of Agriculture, Udaipur, Rajasthan were evaluated for growth and production performance. *Mewari* is the registered breed of native chicken which was registered by the NBAGR, Karnal with Accession Number- INDIA_CHICKEN_1700_ *MEWARI*_12016. *Pratapdhan* is a dual purpose variety propagated across the Rajasthan and adjoining areas. It is a three way cross involving [(Coloured synthetic broiler female line, (CSFL) × Native (*Mewari*)] × Rhode Island Red (RIR). *Pratapdhan* birds have multicolored plumage, longer shanks, consumer acceptability and high productivity. These birds are well accepted by the farmers in Rajasthan.

Rearing and management practices: A total of 844, 1,393 and 995 chicks of *Mewari* (3,232) and 451, 775 and 409 chicks of *Pratapdhan* (1,635) were produced in first (G1), second (G2) and third (G3) generations, respectively. The chicks were wing banded and reared under standard management in each generation. The chicks were reared in brooder cum grower houses having 10′ × 10′ rooms for brooding of the chicks. Brooder temperature was maintained at 95°F in the first week and gradually reduced to 74°F by the end of the 5th week. Chicks were provided *ad lib.* grower ration (2800 kcal/kg of ME and 205 CP on calculated basis) till 18th week of age. During the grower stage, birds were provided only day light. Females were housed in individual cages at 18th weeks of age and reared upto 72 weeks of age. During the layer stage, birds were provided 16 h of light including day light. The chicks were vaccinated against common diseases as per standard vaccination program laid down at the farm.

Traits studied: The data on body weights at day old, 2, 4, 8, 20 and 40 weeks of age; production performance in terms of age at first egg (AFE), age at sexual maturity (ASM), egg weight (EW), and egg production (EP) at 28, 40, 52 and 72 weeks of age were recorded in *Mewari* and *Pratapdhan* chicken in all three generations. The data on fertility and hatchability were also recorded as percentages. Birds were weighed individually at different ages and data recorded on body weights were analyzed statistically. The age at sexual maturity was measured as age at first egg of individual hens. For egg weights at different weeks of age, individual eggs produced on the day were weighed for 5 to 7 consecutive days and data were used for analysis of egg weight at different weeks of age.

Statistical analysis: Completely Randomized Design (CRD) with factorial was utilized for the growth traits. A non-orthogonal factorial experiment with genotype (B), sex (S) and generation (G) (2 × 2 × 3) as main effects for growth and genotype and generation (2 × 3) for production traits was employed for analysis of data using univariate GLM procedure of SPSS 16.0 for Windows (SPSS Inc. 1998).

RESULTS AND DISCUSSION

Growth performance: Genotype, sex and generation effects were significant (P<0.05) on body weights up to 40 weeks of age, except 2nd week body weight, wherein sex had non-significant effect on body weight (Table 1). The interaction effects were also significant (P<0.05) on body weights at all ages except at 2nd week (Table 1) where none of the interactions were significant. However, B×S interaction was not significant at 20 and 40 weeks of age and three way (B×S×G) interactions was non-significant at 2 and 4 weeks of age (Table 1). *Pratapdhan* males in either generation 2 or 3 significantly performed better than others across the genotype, sex and generations (Table 2). The performance of G3 was significantly better than other generations and also between the sexes and genotypes. This might be attributable to the fact that the parents of these birds were on genetic improvement through selection for body weight, which might have improved the body weight over the generations. The positive effect of selection in terminal cross was an established fact in poultry by many authors (Rajkumar *et al.* 2011, 2016, 2020; Haunshi *et al.* 2019).

The body weights were highest in *Pratapdhan* males at all ages in second or third generations followed by *Pratapdhan* females. The *Mewari* males in third generation had higher body weights than *Mewari* females of all generations. The results indicated that *Pratapdhan* performed better than *Mewari*, further males of *Pratapdhan* had higher body weights than all and both *Pratapdhan* and *Mewari* chicken performed better in third generation indicating effect of generation by way of selection being followed in the parents. The data on three factor interaction indicated that the all three factors, viz. breed, sex and generation had pronounced (P<0.05) effect on body weights individually as well as in interactions.

The juvenile body weights recorded in *Mewari* chicken in present study was higher than the body weights recorded by Haunshi and Doley (2011) in Mizo local chicken, however the adult body weights in present study were slightly lower, which may be attributed to the genotype and environmental factors prevailed during the experiment. The body weights found at 8 weeks of age in *Mewari* and *Pratapdhan* were higher than body weights found in indigenous and crosses reported by Padhi *et al.* (1999) and Padhi *et al.* (2004) in Nicobari fowl and crosses.

The body weight found in present study was comparable with the body weights reported by Jha *et al.* (2013) in improved and desi birds under intensive system of rearing. Haunshi *et al.* (2009) have also reported higher body weights in improved germplasm than Miri type of chicken at all the ages, which corroborates findings of present study where *Pratapdhan* had higher body weights at all ages compared to *Mewari* chicken. Further, similar to present study they also reported significant effect of sex on body

Table 1. Effect of genotype, sex, generation and interaction effects on body weight (g) at different weeks

Breed/age	0 day	2nd wk	4th wk	8th wk	20th wk	40th wk
Genotype	*	*	*	*	*	*
Mewari	28.37^{b}±0.07 (3232)	86.42^{b}±1.84 (3160)	182.03^{b}±1.42 (2996)	531.65^{b}±3.41 (2489)	1282.36^{b}±10.13 (1206)	1579.88^{b}±15.14 (585)
Pratapdhan	39.24^{a}±0.13 (1635)	178.91^{a}±1.09 (1646)	278.73^{a}±1.89 (1635)	667.81^{a}±4.42 (1543)	1945.74^{a}±12.65 (945)	2088.57^{a}±22.49 (346)
Sex	*	NS	*	*	*	*
Male	32.49^{a}±0.13 (2034)	118.82±2.99 (2007)	224.02^{a}±2.11 (1950)	628.62^{a}±4.59 (1688)	1730.42^{a}±17.57 (819)	2139.98^{a}±28.69 (264)
Female	31.68^{b}±0.14 (2833)	117.59±1.14 (2798)	210.46^{b}±1.68 (2681)	551.80^{b}±3.58 (2303)	1477.50^{b}±12.70 (1332)	1621.32^{b}±14.01 (679)
Generation	*	*	*	*	*	*
G1	28.64^{c}±0.16 (1295)	84.33^{c}±1.52 (1256)	177.63^{c}±2.99 (1206)	471.32^{c}±7.01 (931)	1408.53^{c}±22.18 (589)	1605.40^{c}±34.27 (183)
G2	32.82^{b}±0.16 (2168)	122.48^{b}±2.85 (2130)	241.90^{a}±1.79 (2018)	609.61^{b}±4.13 (1720)	1646.87^{a}±16.54 (785)	1767.52^{b}±20.78 (420)
G3	33.90^{a}±0.16 (1404)	141.43^{a}±1.32 (1419)	212.30^{b}±2.04 (1407)	630.28^{a}±3.73 (1340)	1625.27^{a}±16.49 (777)	1852.02^{a}±35.73 (340)
Interactions						
B×S	*	NS	*	*	NS	NS
B×G	*	NS	*	*	*	*
S×G	*	NS	*	*	*	*
B×S×G	*	NS	NS	*	*	*

Figures in parentheses represent number of observations. *(P<0.05). Means with different superscripts in a column within the effect differ significantly.

Table 2. Interaction effects between the genotype, sex and generation

Interaction	0 day	2nd wk	4th wk	8th wk	20th wk	40th wk
B1S1G1	26.54^{f}±0.20 (278)	52.69±0.65 (270)	116.10±1.88 (263)	372.32^{f}±5.74 (218)	1275.61^{g}±26.76 (92)	1401.20^{f}±52.74 (20)
B1S1G2	30.26^{e}±0.15 (634)	93.92±8.98 (619)	203.56±2.63 (571)	581.00^{d}±7.03 (445)	1477.87^{e}±30.04 (169)	1916.91^{d}±35.07 (89)
B1S1G3	30.76^{d}±0.14 (516)	112.32±1.14 (516)	209.19±3.69 (514)	662.51^{cd}±6.60 (515)	1559.99^{d}±25.74 (202)	2158.04^{c}±34.39 (53)
B1S2G1	24.79^{g}±0.14 (566)	48.79±0.50 (538)	104.64±1.36 (498)	319.95^{g}±4.58 (332)	988.45^{h}±11.49 (261)	1390.15^{g}±22.33 (119)
B1S2G2	26.55^{f}±0.13 (759)	82.65±0.86 (738)	196.22±2.32 (672)	528.86^{e}±6.30 (500)	1322.95^{f}±19.46 (229)	1469.50^{f}±25.23 (146)
B1S2G3	31.43^{c}±0.14 (479)	115.93±1.20 (479)	224.05±3.78 (478)	587.54^{d}±4.93 (479)	1209.73^{g}±14.76 (253)	1457.82^{f}±17.00 (158)
B2S1G1	34.90^{b}±0.34 (183)	156.91±3.47 (182)	324.49±5.45 (181)	707.68^{b}±16.32 (133)	2035.86^{a}±47.70 (94)	2165.13^{c}±110.28 (15)
B2S1G2	40.81^{a}±0.26 (316)	184.66±2.20 (316)	322.86±3.42 (316)	783.92^{a}±8.23 (316)	1939.61^{b}±26.88 (190)	2455.71^{b}±49.21 (49)
B2S1G3	40.89^{a}±0.37 (107)	203.13±2.61 (105)	207.50±5.83 (105)	685.11^{b}±14.91 (102)	2469.38^{a}±35.22 (72)	2713.88^{a}±48.09 (33)
B2S2G1	34.66^{b}±0.26 (268)	138.65±2.48 (266)	275.94±4.14 (264)	651.09^{c}±12.82 (233)	1851.50^{c}±33.92 (142)	2340.00^{b}±47.16 (29)
B2S2G2	41.22^{a}±0.21 (459)	182.29±1.88 (459)	300.73±2.50 (459)	605.31^{d}±7.18 (459)	1968.19^{ab}±29.27 (164)	1750.04^{e}±19.55 (124)
B2S2G3	40.72^{a}±0.31 (322)	206.51±1.55 (319)	200.96±3.04 (310)	630.57^{c}±8.42 (300)	1820.99^{c}±15.21 (283)	2035.58^{c}±25.98 (96)

Figures in parentheses represent number of observations. *(P<0.05). Means with different superscripts within a column differ significantly. B, Genotype; S, Sex; G, Generation.

weights. The body weights at 20 and 40 weeks of age were higher (P<0.01) in *Pratapdhan* chicken. The adult body weights found in the present study were slightly lower than the body weights reported by Niranjan *et al.* (2008) in different crosses for backyard poultry. The body weight recorded in *Mewari* chicken at 20 and 40 weeks of age in the present study were higher than Miri chicken as reported by Haunshi *et al.* (2009). The body weights of Miri type chickens recorded at four to eight weeks of age were slightly better than those reported for Nicobari fowl (Chatterjee *et al.* 2002). The body weights recorded in the present study at 20 weeks of age were higher than body weights reported by Padhi *et al.* 2004 in Nicobari fowl and crosses. Hassen *et al.* (2006) and Alam *et al.* (2014) reported similar slow growth pattern of adult non-descript local hens in Ethiopia and Bangladesh respectively. Thakur *et al.* (2006) suggested that *Kadaknath* breed reared under tribal villages in central India exhibited similar growth pattern like *Mewari* breed. The body weights of *Pratapdhan* and *Mewari* were higher and lower than the indigenous Aseel breed at different weeks of age Haunshi *et al.* (2009), Rajkumar *et al.* (2017) respectively. Higher body weight in commercial *Vanaraja* compared to the present findings was reported by Islam *et al.* (2014). The adult body weight of *Mewari* in the present study was slightly higher than the body weights reported by Mishra *et al.*(2019) in local native germplasm under free range conditions, which may be attributed to intensive management system.

Production performance: The results of production performance were presented and discussed trait wise like age at 1st egg, ASM, egg weights and egg production.

Age at 1st egg: The average age at first egg in the flock was 138 and 127 days in *Mewari* and *Pratapdhan* chicken. The age at first egg production was lower in *Pratapdhan* as compared to *Mewari*. Islam *et al.* (2014) recorded the lower value of age at first egg in Vanaraja as compared to indigenous. Zuyie *et al.* (2009) in Nagaland also reported similar findings in case of Vanaraja under extensive system of management. However, Kalita *et al.* (2012) recorded lower values of age at first egg than the present value in case of indigenous chicken under intensive system of management. Giri and Sahoo (2012) reported similar age of first lay in *Gramapriya* birds under intensive (138 days) system of management.

Age at sexual maturity: The ASM differed significantly between the genotypes, generations and their interaction effects (Table 3). The age at sexual maturity was 174.21±0.85 and 153.74±0.83 days in *Mewari* and *Pratapdhan* chicken respectively. The ASM was lower (P<0.05) in *Pratapdhan* as compared to *Mewari* chicken. ASM gradually decreased in positive direction over the generations. Haunshi *et al.* (2009) reported that Miri type chickens had early sexual maturity (147.00±1.10 days) compared to the present study. Higher ASM than the present findings were reported in Hill fowl (193 days) of Uttarkhand (Pant *et al.* 2007), in Aseel (203–213 days) breed (Singh *et al.* 2000, Haunshi *et al.* 2011, Rajkumar *et al.* 2017), in Naked neck (189 days) and in Frizzle fowl (192 days) of A and N Islands of India (Padhi *et al.* 2001), Daothigir (180 days) indigenous chicken of Assam (Vij *et al.* 2007). Haunshi *et al.* (2009) reported that there was comparatively higher age of sexual maturity in improved varieties Gramapriya (179.50 days) and Vanaraja birds (197.70 days), which were developed for backyard farming. Niranjan *et al.* (2008) reported 160.89 and 164.79 days in attaining sexual maturity for Gramapriya and Vanaraja birds in backyard farming which were comparable with the findings of the present study. The effect of generation on age at sexual maturity was found to be significant, the ASM reduced in the consecutive generations. Similar results were reported for effect of interaction of breed and generation on age at sexual maturity.

Table 3. ASM, egg weight and egg production at different weeks in *Mewari* and *Pratapdhan*

Breed/age	ASM	Egg weight (g)			
		28 wks	40 wks	52 wks	72 wks
Genotype	*	*	*	*	*
Mewari	174.21^{a}±0.85 (534)	41.30^{b}±0.15 (1015)	44.10^{b}±0.16 (937)	46.21^{b}±0.22 (440)	46.85^{b}±0.22 (445)
Pratapdhan	153.74^{b}±0.83 (553)	47.78^{a}±0.13 (1279)	52.58^{a}±0.16 (922)	54.33^{a}±0.20 (536)	55.74^{a}±0.28 (282)
Generation	*	*	*	*	*
G1	174.44^{a}±1.07 (335)	41.43^{b}±0.19 (621)	45.44^{b}±0.19 (622)	48.34^{b}±0.28 (274)	48.81^{b}±0.29 (256)
G2	168.37^{a}±1.01 (376)	46.23^{a}±0.17 (752)	48.54^{b}±0.21 (534)	50.23^{b}±0.25 (332)	49.89^{b}±0.31 (256)
G3	149.74^{b}±1.01 (376)	46.18^{a}±0.15(921)	50.68^{a}±0.18 (703)	52.78^{a}±0.24 (370)	52.27^{a}±0.30 (256)
Interaction	*	*	*	*	*
B1G1	181.21^{a}±1.65 (140)	36.61^{d}±0.31 (230)	42.73^{d}±0.24 (390)	44.39^{e}±0.37 (154)	45.60^{e}±0.36 (165)
B1G2	187.46^{a}±1.39 (197)	42.09^{c}±0.27 (298)	43.98^{d}±0.30 (260)	46.63^{d}±0.37 (157)	46.84^{d}±0.39 (147)
B1G3	155.99^{c}±1.39 (197)	43.02^{c}±0.21 (487)	46.09^{c}±0.28 (287)	47.87^{c}±0.41 (129)	48.41^{c}±0.41 (133)
B2G1	169.58^{b}±1.40 (195)	44.27^{b}±0.23 (391)	50.00^{b}±0.31 (232)	53.42^{b}±0.42 (120)	54.76^{b}±0.50 (89)
B2G2	147.37^{d}±1.46 (179)	48.94^{a}±0.22 (454)	52.86^{a}±0.29 (274)	53.46^{b}±0.35 (175)	55.15^{b}±0.51 (85)
B2G3	142.87^{e}±1.46 (179)	49.72^{a}±0.22 (434)	53.84^{a}±0.23 (416)	55.41^{a}±0.30 (241)	57.02^{a}±0.45 (108)

Figures in parentheses represent number of observations. *(P<0.05). Means with different superscripts within a column differ significantly. B, Genotype; G, Generation.

Egg weights: The results of egg weights at different weeks of age in *Mewari* and *Pratapdhan* are presented in Table 3. The egg weights significantly varied between the genotypes across the generations. Jha *et al.* (2013) reported the egg weight at 40 weeks and 72 weeks of age were higher in Dahlem Red than Desi and their crosses. The pullet eggs weight, egg weight at 40 weeks of age and increase in egg weight of local desi birds of Jharkhand is better than indigenous Miri type birds of northeastern region of India (Haunshi *et al.* 2009). Niranjan *et al.* (2008) reported higher egg weights at 28, 40 and 72 weeks of age in four crosses namely C1, C2, Gramapriya and Vanraja as compared the egg weights in *Pratapdhan* in the present study. Haunshi *et al.* (2009) also reported higher egg weight at 40 weeks of age. The egg weight found in *Mewari* chicken in the present study was higher than egg weight reported by Kalita *et al.* (2011) in indigenous chicken of Assam. Sharma *et al.*(2018) reported the Vanaraja and Srinidhi eggs were about 62 and 53% bigger than the Desi eggs respectively at 52weeks of age, similarly higher egg weights in *Pratapdhan* were found in present study as compared to *Mewari* chicken. The egg weight at 40 and 52 weeks of age in *Mewari* chicken were higher than the egg weights reported by Islam *et al.* (2014), however the corresponding values reported by them for Vanaraja were higher than the values found for *Pratapdhan* chicken in the present study. In contrast to the present findings, Deka *et al.* (2014) reported much lower egg weight in Vanaraja under backyard system. The present findings for egg weights in *Mewari* chicken were comparable to that values (41 g) reported by Singh *et al.* (2000) and egg weight of 45 g as reported by Ahmad *et al.*(2013) in *Aseel* chickens. Mishra *et al.* (2019) reported egg weight of 40.50 g under free range in local native germplasm which was later on registered as *Mewari* germplasm in southern Rajasthan. The higher egg weights in the present study may be attributed to selection and intensive system of management.

The egg weight in both *Mewari* and *Pratapdhan* chicken significantly improved in different generations irrespective of different ages. Similar finding were also found in the effect of interaction of breed and generations on egg weight at different weeks of age. The information with respect to either generation or its interaction with genetic group is very scanty.

Egg production: The average hen day egg productions (HDEP) at different weeks are presented in Table 4. The average annual HDEP was 92.02 and 158.25 eggs, respectively in *Mewari* and *Pratapdhan* chicken. The egg production has shown an increasing trend over the generations, which might be attributable to the selection practiced in parent populations. The egg production at 40, 52 and 72 weeks of age in the present study were lower than the egg production of three way cross (Padhi *et al.* 2016, Rajkumar *et al.* 2018), two way cross (Rajkumar *et al.* 2019), Gramapriya and C1 cross (Niranjan *et al.* 2008) under farm conditions, which may be attributed to the nature of parent populations involved in the cross.

The annual egg production of *Mewari* chicken in the present study was comparable to the findings of Singh *et al.* (2000) in indigenous chicken. Low egg production than the present findings were observed in indigenous chicken of Assam (53–58 eggs) by Chutia (2010), in Aseel (64 eggs) by Rajkumar *et al.* (2017). Niranjan *et al.* (2008) reported lower values for egg production (149.47±4.46 numbers) for Vanaraja up to 72 weeks of age than *Pratapdhan* chicken. Mishra *et al.* (2019) have reported annual egg production of 43 eggs under free range condition in local native germplasm, which is lower than the present findings which may be due to selection and intensive system of management.

Reproductive performance: Reproductive performance of the birds indicates the mothering ability of the breed. The fertility was not significant between the genotypes. The result on reproductive performance obtained in the present study has been reported elsewhere (Jareda *et al.* 2019). The fertility per cent was 80.39±1.45 and 83.28±0.64 in *Mewari* and *Pratapdhan*, respectively. The mean hatchability on total egg set (TES) was 59.10±2.33 and 66.82±1.03 and on fertile egg set (FES) basis was 73.20±2.29 and 80.29±1.01 in *Mewari* and *Pratapdhan*, respectively. The hatchability on and TES and FES was significantly higher (P<0.05) in *Pratapdhan* as compared to *Mewari*. The fertility and hatchability percentages were lower in the present study than the reports of Sankhyan *et al.* (2016) in indigenous and improved chicken. Similar fertility and hatchability values were reported by Sharma *et al.* (2017) and Islam *et*

Table 4. Egg production in *Mewari* and *Pratapdhan* in different generations

Age/genotype	G1		G2		G3		Mean±SE	
	Mewari	*Pratapdhan*	*Mewari*	*Pratapdhan*	*Mewari*	*Pratapdhan*	*Mewari*	*Pratapdhan*
28 weeks	11.11±0.18 (275)	34.81±1.03 (225)	8.50±0.52 (230)	25.80±1.02 (216)	18.47±0.55 (243)	17.83±0.40 (190)	12.69±0.27 (748)	26.15±0.57 (631)
40 weeks	29.0±0.35 (268)	67.44±1.29 (205)	31.76±0.90 (215)	72.31±1.34 (208)	47.18±0.71 (228)	55.30±1.87 (172)	35.98±0.54 (711)	65.02±0.95 (585)
52 weeks	59.56±0.57 (225)	91.43±1.60 (195)	59.89±0.60 (201)	97.31±1.20 (192)	70.76±0.72 (202)	83.68±1.49 (145)	63.40±0.46 (628)	90.81±0.89 (532)
72 weeks	86.37±0.83 (212)	148.19±1.71 (190)	92.76±0.99 (198)	165.65±2.33 (181)	96.93±0.93 (155)	160.90±2.04 (125)	92.02±0.52 (565)	158.25±1.20 (496)

Figures in parentheses represent number of observations.

al. (2014) Kalita *et al.* (2012) also reported higher rate of hatchability (81–100%) in indigenous chicken of Assam.

Pratapdhan chicken has shown significantly higher growth and production performance as compared to *Mewari* chicken under intensive system of management in all generation. The results suggest that *Pratapdhan* could be potential improved germplasm for backyard poultry production.

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