



Performance of kids of Rohilkhandi under different weaning systems

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ABSTRACT

The study was conducted at Sheep and Goat farm, Livestock Production and Management section, IVRI, Izatnagar. Kids (30) obtained from 23 dams were allocated to 3 treatment groups viz. Gr1: Traditional weaning (kids remained with dam for 3 months and subsequently weaned), Gr2: Partial weaning (kids remained with dam for 1 month, during second month, kids were separated from the dam during day hours but had eye contact and merged with dam in the night further kids were weaned at 60 days), and Gr3: Early weaning (kids remained with dam for 2 months and subsequently weaned). Body weight and measurements were taken every fortnight. Fortnight body weight gain and ADG was also calculated. The daily intake of hay (wheat straw), green fodder (maize/ berseem) and concentrate were recorded. The overall FCR was calculated by dividing average total weight gain from total average dry matter intake. The final body weight in Gr3 was higher than other 2 groups (Gr1 and Gr2) however, the mean body weights were nonsignificant from each other. The total body weight gain (kg) was higher in Gr3 than Gr2, however it was not significantly different from Gr1. The ADG in Gr1, Gr2 and Gr3 were 14g, 21g and 21g, respectively, and values were comparable among the groups. All body measurement CG, HG and PG did not differ significantly between groups. However, BL after fourth fortnight onwards was significantly lower in Gr1 than Gr2 and Gr3. The overall fortnight total DM intake in Gr1, Gr2 and Gr3 were 2.21 ± 0.20 , 2.2 ± 0.20 and 2.09 ± 0.28 kg respectively. The overall FCR was 1: 10, 1: 8.1 and 1: 7.5 in Gr1, Gr2 and Gr3. It can be concluded that either partial or early weaning could be adopted at the farm level.

Key words: Feed, Gain, Kid, Pelvic girth, Weaning, Weight

Weaning is a common practice in large goat farm which helps in early initiation of ovarian activity in does, saving the milk and early rumen development of kid's. In India weaning at 3–4 months is common (Nagpala *et al.* 1995). However, practice of weaning at age of 45–60 days (Ugur *et al.* 2004, Memisi *et al.* 2009) also exists. Ugur *et al.* (2004) concluded that weaning at 45 and 60 days has no influence on growth characteristics but influenced roughage and water consumption in goats. But, early weaning causes stress and requires stringent management practices. Enhancement of plasma cortisol followed by sudden weaning has been recorded. However no stress was observed when kids were prevented from suckling (fabric bag) but remained with their mother (Moneva *et al.* 2011). In previous studies related with temporary isolation and partial weaning in kids, both visual and physical contact was avoided. Further, such works in Indian goats are scanty. Keeping above points in view the study was conducted to record the effect of body growth, feed intake, and FCR under

different weaning systems.

MATERIALS AND METHODS

The study was conducted at Sheep and Goat farm, Livestock Production and Management section, IVRI, Izatnagar. Kids (30) were allocated to 1 of the following treatment groups, viz. Gr1: Kids remained with the dam for 3 months and subsequently weaned; Gr2: Kids partially weaned during day time (9.00 AM - 5.00 PM) from 30th day while maintaining visual contact with dam and were allowed to remain with dam during night thereafter, on completion of the second month, kids were completely weaned; Gr3: Kids were weaned at age of 2 month. The pens were well ventilated, clean and dry with a *pucca* floor and attached open paddock. Standard management practices were followed.

Body weight and body measurements viz. body length, height, heart girth and pelvic girth were recorded at fortnightly interval for each kid. The daily known quantity of hay (wheat *bhusa*), green fodder (maize/ berseem) and concentrate (maize + barley-25%; wheat bran-47%; cake (DSBC + MOC)-25%; mineral mixture- 2% and salt-1%.) was offered to kids after weaning. The leftover feed was

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weighed and feed intake was calculated. Dry matter (DM) intake and feed conversion ration (FCR) were also calculated. The data were pooled and analyzed as per standard statistical procedure (Snedecor and Cochran 1994)

RESULTS AND DISCUSSION

The mean body weights of kids at fortnightly interval from birth to 180 days of age are presented in Table 1. The mean body weights (kg) of kids up to fourth fortnight interval were statistically nonsignificant between groups. However, from fifth to ninth fortnight, body weight of Gr3 remained marginally higher followed by Gr2 and Gr1. Body weight of kids at 180 days was higher in Gr3 than other 2 groups however, it was statistically nonsignificant from each other. Higher body weight in Gr2 and Gr3 might be due to early intake of solid food i.e 60 days compared to Gr1. The difference in body weight gain was more than 1 kg in Gr3

but value was nonsignificant. The results indicated that either partial weaning or early weaning of kids does not have any adverse effect on body growth. However, Nagpala *et al.* (1995) revealed that different weaning practices affected body weights and average daily gain in 3 different goat breeds. Galina *et al.* (2001) found under weaning at different ages, viz. (about 1 week, at 1, 3 or 5 months, restricted suckling and partial weaning) performance of animal affected by the breed, infrastructure in the farm and system of separation. Memisi *et al.* (2009) found that the lowest body weight was observed in early weaned (20 days) kids than late weaned (60 days) kids.

The fortnightly body weight gains (kg) of kids in different groups are presented in Table 1. The total body weight gain was higher in Gr3 than Gr2, however it was not significantly different from Gr1. Further, majority of kids in all the experimental groups experienced body weight

Table 1. Mean body weight (kg) changes of kids under different weaning system at fortnight intervals

Fortnights	Days	Gr1	Gr2	Gr3
0	0	1.78±0.10	1.79±0.14	1.59±0.10
I	60	4.37±0.30	4.97±0.44	4.78±0.42
II	75	4.93±0.40(-)	5.47±0.43(0.51±0.22)	5.36±0.47(0.65±0.04)
III	90	5.21±0.46(-)	5.87±0.43(0.45±0.14)	5.71±0.52(0.44±0.05)
IV	105	5.86±0.53(0.64±0.18)	6.2±0.46(0.43±0.18)	6.13±0.64(0.54±0.14)
V	120	5.87±0.55(0.03±0.04)	6.23±0.46(0.03±0.13)	6.43±0.68(0.03±0.10)
VI	135	5.92±0.55(0.1±0.03)	6.08±0.45(0.09±0.08)	6.48±0.67(0.05±0.08)
VII	150	6.18±0.60(0.16±0.07)	6.56±0.51(0.36±0.09)	7.36±0.70(0.24±0.08)
VIII	165	6.38±0.56(0.2±0.06)	6.91±0.56(0.38±0.08)	7.35±0.70(0.28±0.08)
IX	180	6.48±0.54(0.1±0.08)	7.11±0.67(0.29±0.14)	7.71±0.74(0.36±0.10)
Overall avg.	(0.21±0.07)	(0.32±0.13)	(0.32±0.08)	

Values in parenthesis indicate fortnight body weight gain and its average.

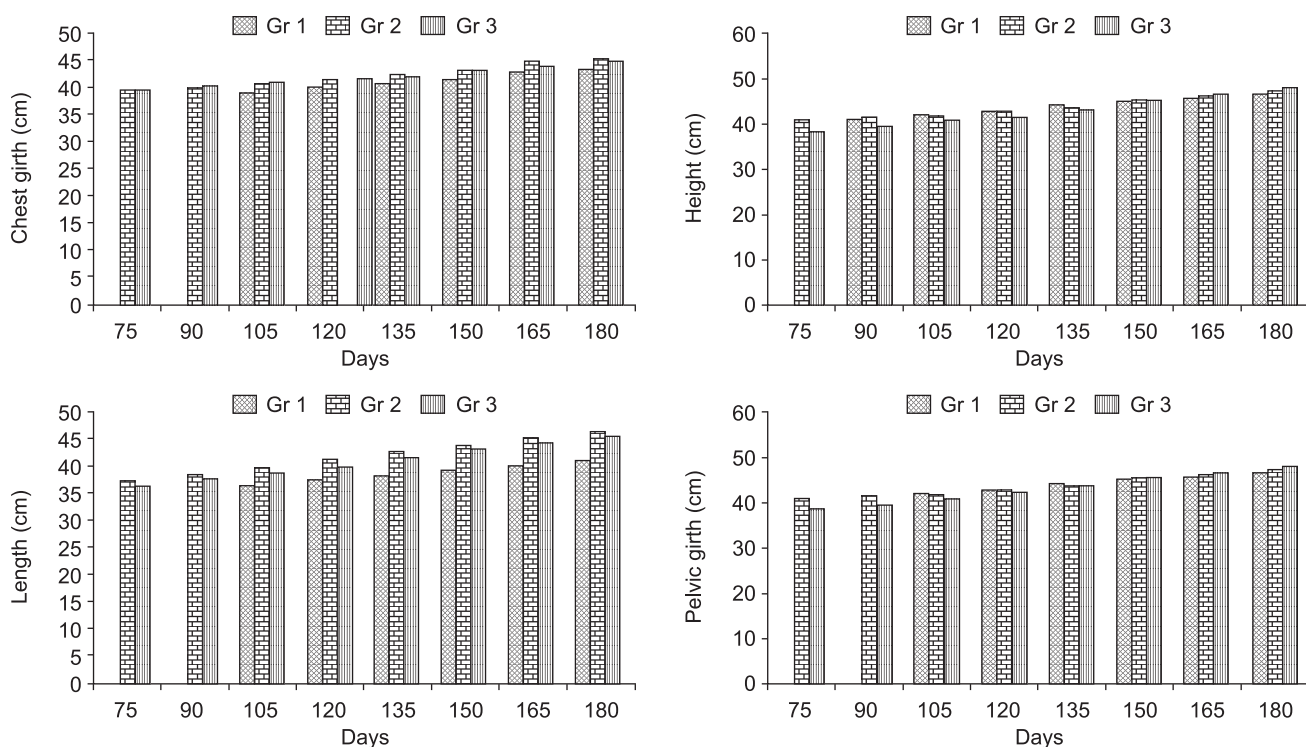


Fig. 1 Mean chest girth (cm) of kids under different weaning system at fortnight intervals.

loss or no gain due to sudden outbreak of coccidiosis during fourth and fifth fortnight which led to low mean body weight gain which coincided with rainy season. The lowest growth in Gr1 might be due to suckling for 90 days which generally delays the rumen development. In contrast to this Palma *et al.* (1995) concluded that faster growth could be obtained if milk was supplied for a longer period than the usual abrupt weaning at 10 kg. Kathale *et al.* (2007) concluded that suckling was more beneficial to have optimum growth of Osmanabadi kids.

The ADG in Gr1, Gr2 and Gr3 were 14g, 21g and 21g respectively. The ADG were comparable among the groups and thus it can be concluded that partial or early weaning did not cause any adverse effect on ADG. Our results are in agreement with Ugur *et al.* (2004).

The fortnightly body measurements of kids in different groups are presented in Fig. 1. The average chest girth (CG) of kids belonging to Gr2 and Gr3 measured marginally higher than Gr1 kids at every fortnight interval, but the values did not differ significantly. This trend persisted throughout the experiment. Final CG (at 180 days) of kids in Gr1, Gr2 and Gr3 showed the similar trend as in the beginning. Final height (at 180 days) and pelvic girth of kids in Gr1, Gr2 and Gr3 followed the same trend as of CG. Significantly higher CG, height and pelvic girth in Gr2 and Gr3 at the end might be due to better growth performance

than control group. The body length (BL) after fourth fortnight onwards was significantly ($P<0.05$) lower in Gr1 than Gr2 and Gr3. Throughout the experiment similar trend was observed. Significantly ($P<0.05$) higher fortnightly BL in kids of Gr2 might be due to higher weight gain in this group than other groups. Direct reference relating body measurements with weaning are scanty. Sharma *et al.* (2010) found that all the pre -weaning growth traits in single born kids were higher than those born as multiple births.

The total green fodder (fresh and DM matter basis) consumed by kids are presented in Table 2. Results indicated that overall green fodder intake in Gr2 was higher than Gr1 and Gr3. However, there was no significant difference between both weaned groups (Gr2 and Gr3). Similar trend was observed for dry matter intake from green fodder (kg). The total concentrate intake (fresh and DM matter basis in kg) is presented in Table 3. The overall kid starter intake was not significantly different among the groups, however, it was slightly higher in Gr2 followed by Gr1 and Gr3. This might be due to habituation of solid feed intake during separation at day time which led to higher consumption of concentrate after weaning at 60 days. Similar trend was observed in all groups for dry matter intake from concentrate. The total hay intake (fresh and DM matter basis in kg) is presented in Table 4. The overall intake of hay was around 1 kg which was consistent throughout the

Table 2. Green fodder (fresh) intake (kg) by kids under different weaning system at different fortnight intervals

Fortnights	Days	Gr1	Gr2	Gr3
1	75	-(-)	2.54±0.23(0.39±0.03)	2.44±0.21(0.41±0.04)
2	90	-(-)	2.79±0.22(0.44±0.04)	2.74±0.24(0.45±0.04)
3	105	2.75±0.24(0.43±0.04)	3.09±0.23(0.47±0.04)	3.01±0.27(0.48±0.04)
4	120	3.09±0.28(0.48±0.04)	3.27±0.24(0.5±0.05)	3.23±0.34(0.51±0.04)
5	135	3.55±0.33(0.48±0.04)	3.77±0.28(0.47±0.07)	3.5±0.54(0.47±0.07)
6	150	3.72±0.34(0.47±0.07)	3.82±0.28(0.48±0.07)	3.66±0.56(0.5±0.04)
7	165	3.63±0.53(0.5±0.05)	3.86±0.52(0.42±0.10)	3.37±0.80(0.48±0.07)
8	180	3.75±0.53(0.52±0.05)	4.06±0.56(0.48±0.09)	3.84±0.73(0.51±0.07)
Total		20.69±2.22(2.89±0.26)	27.2±2.56(3.65±0.49)	25.79±3.69(3.85±0.49)
Overall avg.		3.41±0.37(0.48±0.04)	3.4±0.32(0.48±0.06)	3.22±0.46(0.46±0.04)

Values in parenthesis indicate DM intake through green fodder.

Table 3. Concentrate (fresh) intake (kg) by kids under different weaning system at fortnight

Fortnights	Days	Gr1	Gr2	Gr3
1	75	-(-)	0.68±0.06(0.62±0.05)	0.65±0.06(0.59±0.05)
2	90	-(-)	0.74±0.06(0.68±0.05)	0.73±0.06(0.66±0.06)
3	105	0.71±0.06(0.64±0.06)	0.8±0.06(0.73±0.05)	0.78±0.07(0.71±0.06)
4	120	0.8±0.07(0.73±0.07)	0.84±0.06(0.77±0.06)	0.83±0.09(0.76±0.08)
5	135	0.8±0.07(0.73±0.07)	0.85±0.06(0.77±0.06)	0.79±0.12(0.72±0.11)
6	150	0.81±0.07(0.73±0.07)	0.83±0.06(0.75±0.06)	0.79±0.12(0.72±0.11)
7	165	0.76±0.11(0.69±0.10)	0.8±0.11(0.73±0.10)	0.7±0.17(0.64±0.15)
8	180	0.78±0.11(0.71±0.10)	0.85±0.12(0.77±0.11)	0.8±0.15(0.73±0.14)
Total		4.66±0.015(4.23±0.014)	6.39±0.021 (5.82±0.018)	6.07±0.021(5.53±0.019)
Overall avg.		0.78±0.08(0.71±0.07)	0.80±0.07(0.72±0.06)	0.76±0.10(0.69±0.09)

Values in parenthesis indicate DM intake through concentrate.

Table 4. Hay (fresh) intake (kg) of kids under different weaning system at fortnight intervals

Fortnights	Days	Gr1	Gr2	Gr3
1	75	-(-)	0.89±0.08(0.81±0.07)	0.86±0.07(0.78±0.07)
2	90	-(-)	0.98±0.08(0.89±0.07)	0.96±0.08(0.88±0.08)
3	105	0.94±0.08(0.85±0.07)	1.05±0.08(0.96±0.07)	1.03±0.09(0.93±0.08)
4	120	1.05±0.10(0.96±0.09)	1.11±0.08(1.01±0.08)	1.1±0.11(1±0.10)
5	135	1.05±0.10(0.96±0.09)	1.12±0.08(1.02±0.08)	1.04±0.16(0.95±0.14)
6	150	1.06±0.10(0.97±0.09)	1.09±0.08(0.99±0.07)	1.05±0.16(0.95±0.14)
7	165	1±0.15(0.91±0.13)	1.06±0.14(0.96±0.13)	0.93±0.22(0.84±0.20)
8	180	1.03±0.15(0.94±0.13)	1.12±0.15(1.02±0.14)	1.06±0.20(0.96±0.18)
Total		6.13±0.68(5.49±0.6)	8.62±0.77(7.66±0.71)	8.03±1.09(7.29±0.99)
Overall avg.		1.02±0.11(0.93±0.1)	1.05±0.09(0.96±0.08)	1.00±0.14(0.91±0.12)

Values in parenthesis indicate DM intake through hay.

Table 5. Mean total DM (kg) intake of kids under different weaning system at fortnight intervals

Fortnights	Days	Gr1	Gr2	Gr3
1	75	0	1.86±0.17	1.79±0.16
2	90	0	2.05±0.16	2.01±0.17
3	105	1.95±0.17	2.2±0.16	2.14±0.19
4	120	2.2±0.20	2.33±0.17	2.3±0.24
5	135	2.2±0.21	2.34±0.17	2.17±0.33
6	150	2.22±0.21	2.28±0.17	2.19±0.33
7	165	2.32±0.22	2.21±0.30	1.93±0.46
8	180	2.39±0.21	2.33±0.32	2.21±0.42
Overall avg.		2.21±0.20	2.2±0.20	2.09±0.28

experimental period. Since mean intake of hay at 105 days periods in Gr2 and Gr3 was marginally higher indicating the early habit of consuming the solid feed/dry fodder. However, this was consistent during later part of the experiment also. Ugur *et al.* (2004) found that 45 days weaned kids consumed more roughage than those in 60 day group.

Fortnightly total dry matter intake (kg) is presented in Table 5. The overall mean values were comparable among the treatment groups. The mean values were nonsignificant ($P>0.05$) at different intervals. Nagpala *et al.* (1995) concluded that feed intake per 100 kg body weight was significantly influenced by genotype and weaning age. It was slightly higher in kids weaned at 2 months of age than in those weaned at 3 months.

The overall FCR was 1: 10, 1: 8.1 and 1: 7.5 in Gr1, Gr2 and Gr3, respectively. The better FCR in Gr3 might be due to low intake of DM coincided with proper growth. However, body weight gain remained less in Gr3 group compared to other groups during the experimental period. Poor FCR in Gr1 could be due to slow adaptation by kids from milk to solid feed. Few studies support our results (Ugur *et al.* 2004, Knights *et al.* 2012). In contrast to our results Nagpala *et al.* (1995) found that neither feed intake nor FCR were significantly influenced by weaning age.

Different weaning system has no affect on the body growth, body measurement and dry mater intake. However,

FCR was comparatively good in sudden weaned /partial weaned kids than traditional system.

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