



Expected genetic gain in milk production trait through progeny testing in Murrah buffalo herds

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Murrah is one of the best milch breeds of buffaloes with tremendous potential for further genetic improvement. Genetic gain estimates in breeding programmes are important to critically analyze efficiency and to plan new actions and strategies. Many studies have examined genetic gain considerably less than what is possible under ideal circumstances. The purpose of this study was to examine the 2 major factors that affect genetic gain per year for milk production: average genetic selection differentials and generation intervals by year.

In the present study breeding information from Set 1 to Set 7 spread over a period of 14 years from 1995 to 2008, was collected from the history-cum-pedigree sheets and milk yield registers of Murrah buffaloes. The Murrah bulls in 7 sets were inducted for progeny testing at Central Institute for Research on Buffalo (CIRB), Hisar; National Dairy Research Institute (NDRI), Karnal; Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana; Choudhary Charan Singh Haryana Agricultural University (CCSHAU), Hisar. The first lactation 305-days or less milk yield (FL305MY) records of 832 daughters of 95 bulls were used for this study. The effect of fixed effects

such as year and season of calving on 305-days or less milk yields was studied by least-squares analysis using the technique described by Harvey (1966). Paternal half-sib correlation method (Becker 1975) was used to estimate the heritability of trait.

Expected genetic gain per year was calculated as per Falconer (1981).

$$\Delta G = (h^2 \cdot S) / GI$$

where, ΔG , expected genetic gain per year; S, selection differential; h^2 , heritability of the trait; and GI, generation interval.

Least-squares analysis showed that year and season of calving did not affect the trait significantly. The estimate of heritability for first lactation 305-days or less milk yield obtained as 0.22 in Murrah buffaloes. The estimated heritability was almost similar with the results obtained by Gupta (2009), Patil (2011), Aspilcueta-Borquis *et al.* (2010) and Malhado *et al.* (2013). Set-wise generation interval was estimated. Generation interval was found to be 5.51, 4.86, 4.69, 4.68, 4.62, 4.56, and 4.18 years in set 1 to set 7. It was found that generation interval reduced first set onward due to use of comparatively younger buffalo bulls. Reduced

Table 1. Set-wise expected genetic gain for first lactation 305-days or less milk yield (kg)

Set	No. of daughters	Selection differential	Gain per generation	Annual gain%	Annual gain
1	118	54.2	11.92	2.16	0.12
2	115	41.2	9.06	1.87	0.10
3	113	288.1	63.38	13.51	0.78
4	121	135.9	29.90	6.39	0.37
5	141	271.7	59.77	12.94	0.73
6	131	188.2	41.40	9.08	0.50
7	126	187.4	41.23	9.86	0.55

*Heritability of FL305MY is 0.22.

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generation interval had positive impact on the expected annual genetic gain. Set-wise expected annual genetic gain was also estimated. Selection differential in set 1 to set 7 was found to be 54.2, 41.2, 288.1, 135.9, 271.7, 188.2, and 187.4 kg. Corresponding expected genetic gain per

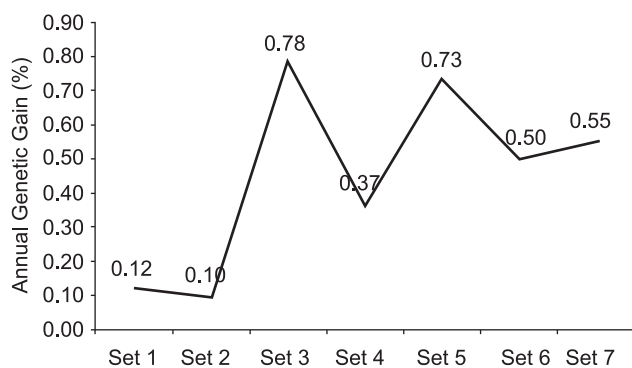


Fig. 1. Set-wise annual percent expected genetic gain for first lactation 305-days or less milk yield.

generation was found as 11.92, 9.06, 63.38, 29.90, 59.77, 41.40, and 41.23 kg (Table 1). Expected annual genetic gain was estimated by dividing expected genetic gain per generation by the generation interval in the set. It was least (1.87 kg / year) in set 2 and maximum (13.51 kg / year) in set 3. In the term of per cent expected annual genetic gain best result was found in set 3 with 0.78% (Fig. 1).

SUMMARY

The information of Murrah buffalo bulls from 7 sets of progeny testing under Network Project on Murrah buffalo improvement and maintained at Central Institute for Research on Buffalo (CIRB), Hisar; National Dairy Research Institute (NDRI), Karnal; Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana; and Choudhary Charan Singh Haryana Agricultural University (CCSHAU), Hisar were used to

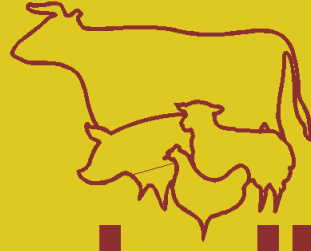
estimate genetic gain. The first lactation 305-days or less milk yield (FL305MY) records of 832 daughters of 95 bulls. In the term of percent expected annual genetic gain best result found in set 3 with 0.78%.

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A nutritionally balanced 'livestock feed basket' improves the productivity of animals and simultaneously the economic condition of animal keepers. Feed requirement varies from species to species and from one geographic zone to another depending upon the animal potential and plant-soil-animal relationship. Several institutes of the Indian Council of Agricultural Research, have been working on these crucial aspects of animal nutrition since their inception. Earlier, ICAR published Nutrient Requirement of Livestock and Poultry in 1985 and 1998. Changing climate, vegetation cover and expectations of human population from animal resources have greatly affected the animal sector scenario. Realizing the fact that detailed information is required on nutrient composition of various feeds and fodders, the Council constituted a National Committee on Nutrient Requirements of Animals for compilation of information generated by these institutes.

In this present attempt the Committee has brought out 'Nutrient Requirements of Animals' – a series of ten publications. For the first time nutrient requirements of Camel, Yak and mithun, Companion, laboratory and captive wild animals besides Finfish and shellfish have been compiled. This series will be a must reference resource for livestock policy-framers, researchers, academicians, extension officials and grassroot farmers who steer positive changes in the societies' nutritional security and social integration.



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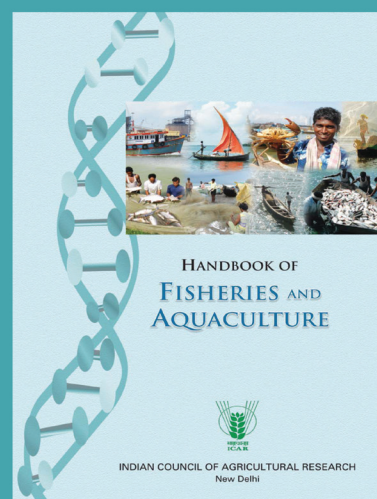
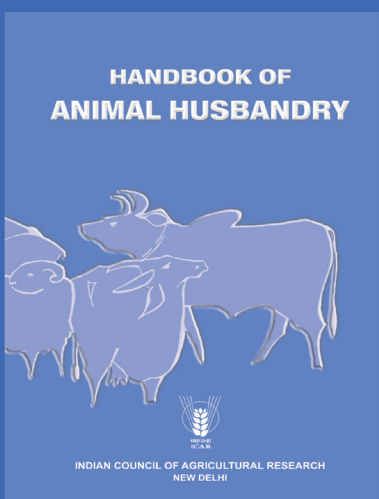
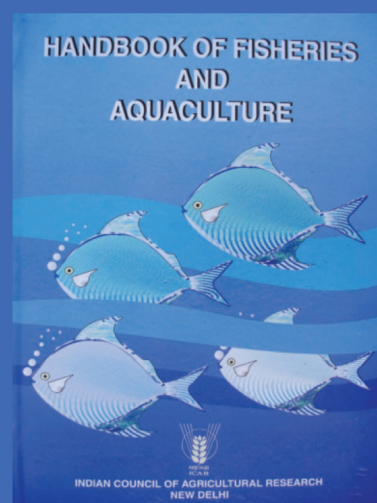
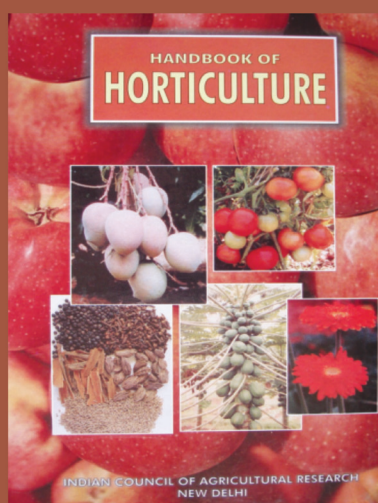
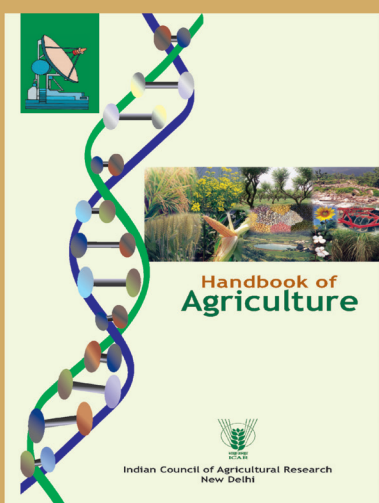
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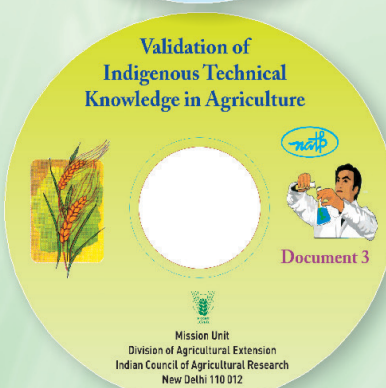
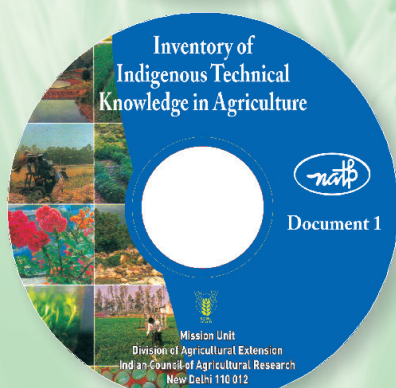
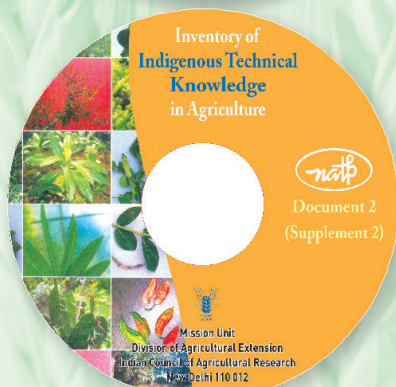
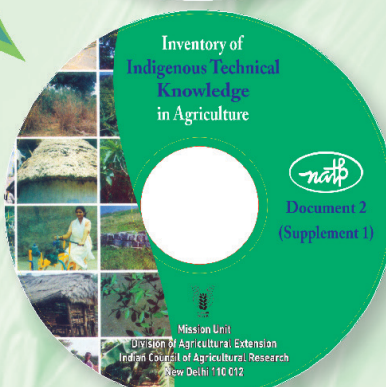
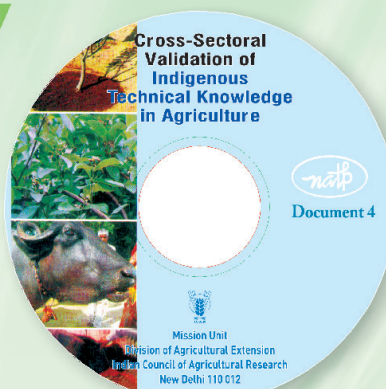
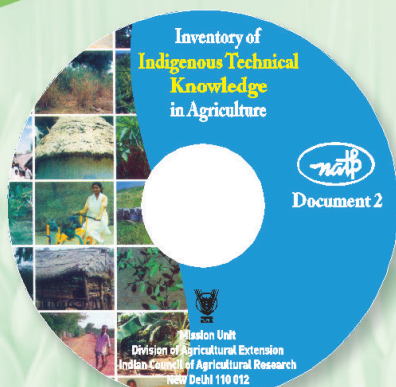


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