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## Feeding ‘Balanced Concentrate Feed’ to Increase Livestock Productivity: An Experimental Study in Bihar, India

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### Abstract

Dairying is an integral part of small-holder farming systems as well as an important source of subsidiary income for most households in Bihar, India and most farmers keep 2-3 cattle. Nevertheless, the per-capita milk availability in Bihar is very low ( $175 \text{ g d}^{-1}$ ) compared to the Indian average ( $290 \text{ g d}^{-1}$ ) in 2011-12 as productivity is low, mainly because current feeding is based mainly on crop residues (wheat and rice straw). Constraints to improving these feeding practices include limited farm resources, weak support services and poor knowledge on nutrient requirements and contents. The present study examines the effect of a balanced concentrate feed on livestock productivity in Samastipur and Muzaffarpur districts of Bihar, in comparison to existing feeding practices. Hereby, farmers supplement residues with either individual concentrate components (brans, crushed grains etc.) or locally available commercial concentrates. The new balanced concentrate consists of crushed grains (37%), cereal brans (30%), pulse husks (10%), oil cakes (20%) and minerals. This results in higher levels of metabolizable energy and digestibility compared to the available commercial feeds according to laboratory analysis. This new feed was introduced through a combination of participatory trainings on nutrition and feeding, demonstrations on feed preparation and farm-based dairy feeding trials which included 400 crossbred dairy cattle kept by 400 farmers. On average, farmers were feeding 4.2 kg commercial and/or home-made concentrate feed per dairy animal/day, adjusted to individual milk yields. After replacing the existing supplements with a reduced amount (3.4 kg) of new concentrate feed, average milk yield, fat % and solids-not-fat (SNF) % increased by 14%, 23% and 5%, respectively. Data analysis suggests that dairy farmers can simultaneously reduce their cost of milk production (reducing the amount by 24% more than offsets the price difference of 18%) and increase their revenue from increased milk sales. The new concentrate feed also showed better palatability as well as positive effects on health and reproductive performance in terms of animal appearance and early conception. Finally, the new feed does not require cooking, a common practice. Methods are explored to disseminate this balanced concentrate feed to a larger section of farmers in the state.

**Keywords:** Balanced concentrate feed, experimental, livestock productivity, SHGs