

Effectiveness of the Provision of Extension Services for Small-holder Dairy Farmers in Two Regions of the Punjab in Pakistan.

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The agrarian based economy of Pakistan is dependent on the output of over 8 million small-holder dairy farmers, 70% of who own less than 5 milking buffalo or cattle. The commercial value of milk exceeds the combined value of wheat, rice, maize and sugarcane from Pakistan. Yet the average daily production per milking animal seldom exceeds 10L, which is well below the genetic potential of many of these milking animals. This is most often due to the persistence of time honoured practices of feeding animals passed without modification through generations of farmers. Only 40% of these farmers in Punjab have access to extension services and most of these relate simply to the provision of vaccines, drenches and artificial insemination. The adoption of advice however is limited by poor education and an innate scepticism for implementing change.

In this study we have assessed the relationship between the adoption of advice to feed forage and water *ad libitum* and the provision of better veterinary services in 2 communities varying in socioeconomic development: the first group of 121 farmers located near Okara, 100km to the west of Lahore, have been serviced by both state and corporate agencies over the past 15 years, while the second group (n=107) from Bhakkar 300km to the west of Lahore have received little assistance from any organisation. Of these farmers 79% tied up their animals in the Okara regions, while all farmers enrolled in our study from Bhakkar tied up their animals. Farmers were trained to record milk production by weighing milk daily and this was checked by trained extension workers on a weekly basis over 2 years. The impact of the adoption of new feeding/watering strategies on milk production was analysed by repeated measures analysis of variance, with a 5% significance level.

Of the 121 Okara farmers 33% had adopted the new practice of feeding and watering of animals *ad libitum*, while only 9% had in Bhakkar. This translated into a significant improvement in milk production among the innovative technology adopters over the first 12 months from 5.31 to 5.98 litres/day ($P < 0.05$). This represents a 5% increase over this period (table 1).

Table 1. average milk production for farms following traditional and improved farming practices

Year	Month	Milk Production (L/day)		Number of Farms Implementing Change
		Traditional Practices	Improved Practices	
2008	June	4.86	4.11	2
	Sept	4.79	7.34	2
	Dec	5.31	5.98	15
2009	Mar	5.59	5.83	15
	June	4.84	4.88	32
	Sept	5.40	6.21	37
	Dec	5.38	6.15	48

The data show that communities exposed previously to technical services and better education systems are more likely to adopt novel ideas in their farming practices. Adoption of free access to feed and water results in a significant increase in milk output and therefore farm profitability. The rate of adoption of new farming practices is dependent on the willingness of farmers to accept risk in the face of clear market signals that the changes will be profitable and not compromise food security for their families. We are currently adopting an integrated analysis tool (Lisson, MacLeod et al. 2008) to quantify these improved outputs in Pakistani.

Lisson S., MacLeod N., McDonald C., Corfield J., Wirajaswadi L., Rahman R., Bahar S., Razak N., Puspadi K., Dahlanuddin, Sutaryono D., Padjung R., Saenong S., Hadiawati L., Sahardi Mashur, Proptomo D. (2008). Improving smallholder crop-livestock systems in eastern Indonesia. Canberra, Australian Centre for International Research: p.89.

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