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# Assessing green house gas emission from liquid milk production system in Punjab

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Works conducted on green house gas emission (GHG) from dairy production system in India are mostly restricted to enteric fermentation and manure management system (MMS). An excel based model was developed to estimate GHG emission from liquid milk production system in Punjab based on the guidelines of Intergovernmental Panel on Climate Change (IPCC, 2006). The bovine population data for Punjab was collected from 18th livestock census report. The information on nutritional parameters, management system and other parameters were collected from published reports. However, certain assumptions were made due to unavailability of information on state specific MMS, distance between farm to consumer and livestock feed store. The respective methane emission factors (kg $CH_4$,head$^{-1}$year$^{-1}$) for indigenous cattle, crossbred cattle and buffalo females were found to range between 10.64 to 26.93, 11.76 to 33.60 and 11.48 to 35.66 whereas for their male counterparts it was estimated at 11.97 to 18.16 for indigenous, 11.49 to 20.30 for crossbred and 14.01 to 27.01 for buffalo. The major source of $N_2O$ emission from MMS was found to be direct N2O emission (59 to 99%) whereas indirect $N_2O$ emission was insignificant. However, the total emission ($CO_2$ eq/year) from enteric fermentation and MMS of bovines in the state was estimated as 5617.7 Gg. Comparison between different sources of GHG emission from liquid milk production chain revealed that enteric emission is the highest contributor (61.38 to 67.47), followed by emission due to fertilizer application from crop residue and fodder cultivation (29.17 to 35.14), then $CH_4$ emission from MMS (0.55 to 1.73), followed by feed and milk transportation (0.64 to 1.95), whereas $N_2O$ emission from MMS (0.22 to 0.27) is the lowest. The highest emission per kg of FPCM (fat protein corrected milk) and per kg milk protein yield was estimated for indigenous cattle.

**Keywords:** Emission, green house gas, enteric methane, nitrous oxide.

## Biography

Anjumoni Mech is presently working as scientist at National Institute of Animal Nutrition and physiology, Bangalore, Karnataka, India. Prior to NIANP she was at NRC on Mithun, Nagaland, for nine years as a scientist. She has done her PhD in livestock production and management from National Dairy Research Institute, Haryana, India. She was involved in various projects like: evaluating lactation performance, growth performance and draught power in Mithun, evaluating apparent absorption efficiency of colostral immunity in Mithun neonates, genetic characterization of microbes available in Mithun rumen fluid, Mithun milk protein and lipid characterization. Recently she has undergone a two months training on life cycle assessment of Agricultural GHG emission at Scotland's Rural College, Edinburgh, Scotland.

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