Evaluating the Taiwanese Nitrogen Footprint of Food Production

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Abstract

The emissions of reactive nitrogen (Nr) have been well known to cause many environmental problems and human health issues. Recently, the nitrogen (N) footprint indicator has been developed and used to specify the influence of the human use of reactive nitrogen on the environment. Taiwan’s Virtual Nitrogen Factors (VNFs; factors that describe average N losses during food production by food type) are similar to Japan’s VNFs (without accounting for trade) possibly due to comparable dietary and farming technologies. The average VNF of fruit is much higher than other vegetable products. Comparisons of the VNFs between Taiwan and Japan (without trade) follow the same pattern. The 10-year average total food production N footprint in Taiwan was 28 kg N/capita/yr. The footprints for vegetable and animal products were 10 and 18 kg N/capita/yr, respectively. The N footprint of Taiwan is similar to Japan (with trade) and the USA. Japan and Taiwan are in similar geographic locations, with the same farming patterns and dietary behaviours. On the contrary, there is no significant likely nitrogen consumption pattern between Taiwan and the US. Overall, the results showed that N footprint calculation is highly dependent on food production processes per unit of Nr consumed. Therefore, in future studies we will need to calculate the N footprint with and without international trade to estimate the environmental impacts. Furthermore, there are many other factors which will influence nitrogen emissions such as socio-economic factors, which need to also be analysed in the future.

Key Words

nitrogen footprint, food production, GDP, elderly population