Effect of improving Diet Quality by Feeding Supplements on Methane Emission in different Production Systems of Beef Cattle in Brazil

J. Geraldo De Lima[a], A. Bannink[b], A. Van Den Pol Van Dasselaar[b], L.G. Barioni[c] and P. Menezes Santos[d]

[a]University of São Paulo, Avenida Pádua Dias, 11, 13418-900 Piracicaba, Brazil; [b]Wageningen UR Livestock Research, PO Box, 65, 8200 A Lelystad, Netherlands; [c]Embrapa Agriculture Informatics, Av. André Tosello, 209, Barão G., 13083-886 Campinas - Sp, Brazil; [d]Embrapa Southeast Livestock, Rodovia Washington Luiz, km 234, 13560-970 São Carlos, Brazil

barionilg@gmail.com

In Brazil, the national inventories on methane emission are carried out using the Tier 2 approach published by the Intergovernmental Panel on Climate Change (IPCC). Although, IPCC recommends the use of a more specific Tier 3 approach, this is hampered by a lack of consolidated data for development, evaluation and application of such a Tier 3 approach.

The purpose of this study was to estimate the effect of improving diet quality by feeding supplements on methane emission, calculated by both a Tier 2 and an extant Tier 3 approach, in different production systems of beef cattle in Brazil:

(1) high quality diet and feedlot feeding from weaning to slaughter- FSFF - Feedlot finishing (14 mth);

(2) energy and protein supplementation - ESPF - Pasture finishing (20 mth);

(3) protein supplementation during dry and wet season - PSFF - Feedlot finishing (24 mth);

(4) protein supplementation dry at first and second dry seasons combined with ad libitum mineral salt supplementation and protein supplementation wet at first and second wet season, respectively- PSPF - Pasture finishing (30 mth);

(5) urea supplementation with mineral salt during the dry season and ad libitum salt during the wet season - USFF - Feedlot finishing (36 mth);

(6) urea salt during the dry season and ad libitum mineral salt during the wet season - USPF - Pasture finishing (44 mth).

Tier 2 and Tier 3 approaches estimated a profound effect of supplementation on methane emission. Tier 2 estimates ranged from 168 (USPF) to 35 kg per animal (FSFF) while Tier 3 estimates ranged from 145 (USPF) to 32 (FSFF) kg per animal. Using a Tier 3 approach for Brazilian conditions led to lower predictions of enteric methane compared to the IPCC Tier 2 approach.

This study is part of the FP7 AnimalChange project (Grant Agreement 266018) and co-financed by the Dutch Ministry of Economic Affairs (KB-12-006.04-003). The first author also acknowledges the financial support of the Capes (Cordenação de Aperfeiçoamento de Pessoal de Nível Superior) for granting a graduate scholarship (2013/9820/12-4), besides financial support for training at Wageningen University Research Centre.