

MAF POLICY

Agricultural Inventory Panel Meeting

27 November 2009



**Agricultural Greenhouse Gas Inventory Advisory Panel Meeting
27 November 2009**

MAF, Pastoral House Meeting room 16.1

Minutes

Meeting start:12.30

Attendees:

Alice Marfell-Jones (Chair, MAF), Andrea Pickering (Minutes, MAF), Andy Reisinger (RSNZ, Victoria University), Frank Kelliher (NzOnet, AgResearch), Keith Lassey (Methanet, NIWA), Sonia Petrie (MfE)

The purpose of the meeting was for panel members to discuss and approve proposed changes to the Agricultural Greenhouse Gas (GHG) Inventory. The panel would then advise the Deputy Director General (DDG MAF) of which changes were considered scientifically robust enough to implement. Three proposed changes were presented to the panel at the meeting. A briefing paper, the report and a reviewers report were all submitted for each proposed change for discussion and agreement. Summaries of reports are found in the briefing papers.

Change one: Review of New Zealand specific $Frac_{gasm}$ and $Frac_{gasf}$ emissions factors.

1. Panel were happy with the choice of international reviewer, that being Keith Smith. He is one of the best available.
2. There is value in publishing a synthesized version of the review under consideration in a scientific journal. It was of a high calibre and such a review would benefit the scientific community.
3. The brief is too amended with the addition of the standard error information.

Decision/action

- Amend brief (note 3 above) and distribute to panel members for final approval.

Action :**Andrea**

- Approve the change of $\text{Frac}_{\text{gas}m}$ from the IPCC default of 0.2 to a country specific value of 0.1.
- Approve the change of $\text{Frac}_{\text{gas}f}$ from an IPCC default of 0.1 to a country specific value of 0.1

Change two: Reducing uncertainty of the enteric methane emissions inventory

1. Two disclaimers apply to this report. Both Frank Kelliher and Keith Lassey are authors on this report. In the event of a split panel on the decision to incorporate the change, their votes will be removed.
2. The reviewer suggested that the nomenclature of coefficient of variation be changed to “percentage standard error”. This has been passed on to authors along with other suggestions from the reviewer.
3. Clarification was made that currently the calculation of the inventories uncertainty is based on the standard deviation. One of the changes reported here is that the new approach proposed is based on the standard error, which is more appropriate.
4. Paragraph 9 in the briefing paper needs to be edited to be clearer.
 - a. The statement of no significant difference between indoors and outdoors experiments appears to conflict with a statement in the appendices (pages 5 and 22 of the report). The authors have resolved the issue and it has been concluded that there is a difference between methane yields between grazing sheep and indoor sheep, for either age group, and it is highly significant, contrary to the statement on p5. In contrast, the difference between methane yields for juvenile (<1 year old) and mature (>1 year old) sheep is not significant, even though for grazing animals that difference is quite large.
 - b. It was noted that this may mean that the reappraised uncertainty in the enteric inventory in section 4 of Kelliher et al. (p9) may need to have the different animal classes appraised separately (ie, the CV of 3% may not be defensible for the methane yield of the "sheep <1 yr old" category). However, any such reappraisal is likely to be minor, and could await the greater rigour of a peer-reviewed article.
5. Frank suggested a second recommendation that is more in line with the recommendations of from the report, that being “based on this change in the

uncertainty of the methane yield, the overall uncertainty of the enteric methane emissions inventory, expressed as a 95% confidence interval, would be $\pm 16\%$.”

6. A third recommendation was suggested to “note that the uncertainty analysis on the methane yield was determined using statistical methods only and doesn’t account for a potential bias in methane emission yield for sheep < 1 year old that was noted in the report”.
7. Panel members agree with the recommendation in the report that further research into the mean value of the methane yield by sheep under 1 year old should be undertaken to determine if the current value is appropriate. This may lead to a revision of the mean yield for this category. It is noted that the IPCC Tier 1 default emission factor for sheep is lower for juvenile sheep (nominally less than 1-yr old) than for mature sheep, and that these factors derive from NZ data. A revision of this emission factor would therefore be of international significance.
8. Andy suggested clarification in paragraph 13 by adding “based on this statistical analyses” this gives a “95%” certainty that the inventory’s true value is $\pm 16\%$.
9. This will be published in a scientific journal. Currently no time frame

Decision/actions:

- Clarify and reword paragraph 9 and 13 in briefing paper. Action: **Frank** to clarify statement as per note 3, **Andrea** to edit as per note 3 and 7.
- Add 2 new recommendations to briefing paper (notes 4 and 5 above).
Action: **Andrea**
- Approve the advising that the uncertainty of enteric methane emissions be reduced to a CV of 3% for CH₄ yield for sheep and cattle.
- Advise that the uncertainty of the enteric methane emissions inventory will be expressed as a 95% confidence interval, that being the mean $\pm 16\%$.
- Note that the uncertainty analysis was done using statistical techniques only and doesn’t account for a potential bias in methane emission yield, especially for sheep < 1 year old
- Publish paper Action: **Authors**

Change three: A comparison of greenhouse gas emissions from the New Zealand dairy sector calculated using either national or a regional approach.

1. The recommendation to move to a regional calculation for dairy, with changes as detailed in the briefing paper, was approved by all panel members.
2. It was noted that there is a tier 3 model in development for determining nitrous oxide emissions at a regional level.
 - a. This model concentrates on nitrous oxide from manure. The model includes weather and soil data among other things. This method will create huge year to year variation due to weather patterns. It is still a few years off before the methodology will be able to be used.
 - b. Nitrous oxide from fertiliser at a regional level will be complicated. To do so may compromise the confidential data supplied by companies. Also fertiliser may not be used in the same month it is bought, or for dairying in the same region.
3. The report does not quantify the effect of the new regional calculation method on the uncertainty of the inventory. Although the sample error for each individual region may increase compared to a national error value due to smaller population samples, as the aggregated population is constrained to match the national population within its level of uncertainty, then the error in the national emission will not be made greater through regional aggregation. The panel recommends a further piece of work which re-analyses the uncertainty around the methane emissions of dairy based on a regional calculation. This will be potentially with a Monte Carlo method.
4. The panel also suggested sensitivity analyses around the inputs to determine which variables affect the final outcome the most be carried out during this re-analyses.
5. The main advantage of the regional method is that it would be able to capture the effect of future regional mitigation efforts in the dairy sector.

Decision/actions:

- Advise that the calculations for dairy emissions be carried out a regional level using the methodology outlined in the report with the amendments as per the briefing paper.
- Recommend further work be carried out on the uncertainty of the regional calculations for dairy.

General

1. There should be strong encouragement of report authors to publish work in a scientific journal.
2. If not published in a scientific journal it is recommended for future changes that two (2) reviewers be approached to review reports.
3. The current method of choosing reviewers is to consult extensively with authors, industry and other scientists for recommendations. This was determined to be acceptable.
4. The outcome of this meeting will be reported at the Methanet/N₂Onet meeting
5. The meeting will be reported on in the Agricultural chapter of the National Inventories next submission.

Summary

1. All changes proposed to inventory have been approved with amendments as detailed.
2. Clarification required of significant difference statement in the “improving the uncertainty of the inventory” paper, paragraph 9. Action: **Frank**
3. Amendments to briefing papers. Action: **Andrea**
 - a. Changing Frac_{gasm} and Frac_{gasf}:
 - i. The brief is too amended with the addition of the standard error information
 - b. Improving the uncertainty of the Inventory :
 - i. two added recommendations added to briefing
 - ii. paragraph’s 9 and 13 to be edited
 - c. Regionalisation of dairy
 - i. Recommend further work on uncertainty relating to regionalisation of dairy
4. The outcome of this meeting will be reported at the Methanet/N₂Onet meeting
Action: **Frank/Keith**
5. The meeting will be reported on in the Agricultural chapter of the National Inventories next submission. Action: **Andrea**

6. Publish paper on improving the uncertainty in the agricultural inventory. Action:
Authors

Meeting closed 15:30