



BETTER ESTIMATION OF NATIONAL LIVELWEIGHT – PART 2 BEEF COWS

Authors: Andrea Pickering

Main Purpose: ☒ Decide ☒ Discuss ☐ Note

Purpose of Report

1. Seek approval from the Agricultural Inventory Advisory panel to change the method in which beef cow liveweights are determined.
2. Attached to this paper are:
 - I. The report “*Better estimation of National Ewe and Beef Cow Liveweights*”.
 - II. The review of the above report by RD Thomson.
3. This briefing is 1 of 2 briefings on estimating national liveweights.

Summary

Background

4. New Zealand has an obligation under United Nations Framework Convention on Climate Change Convention (UNFCCC) to report the anthropogenic greenhouse gas emissions and removals every year. Emissions are reported in the annual submission of the National Inventory Report submitted to the UNFCCC. New Zealand also has a responsibility under the Kyoto Protocol to reduce emissions growth and if not successful will incur a financial cost.
5. The National Inventory Report (NIR) forms the base of any financial cost that the country may have under the Kyoto Protocol. Therefore reported emissions and removals need to be as accurate as possible. New Zealand has a long standing research program in estimating country specific emission factors to aid in the improvement of reported emissions and removals from the land based sectors.
6. Changes beyond the default methodology and emission factors to take account of country specific factors are encouraged and need to be well documented and transparent.

Current Inventory

7. The Inventory model estimates dry matter intake, and consequently methane emissions and nitrogen excretion, based on productivity inputs including the live-weight of an animal.
8. It is difficult to estimate beef cow liveweight as slaughter data for beef cows is incorporated with dairy cow carcass weight. Fortunately the Livestock Improvement Corporation (LIC) reports live weights for dairy cows. This data, along with slaughter data and some assumptions are used to estimate beef cow liveweight.
9. The following steps are taken to estimate beef cow liveweight:
 - I. The number of beef cows slaughtered is assumed to be 25 percent of the total herd.
 - II. Twenty-five percent of the beef breeding cow herd is determined using 25 percent of the Statistics NZ population data for breeding beef cows. This value is subtracted from the slaughter cow number reported by MAF. The remainder of the slaughtered cows are assumed to be from the dairy herd.
 - III. The average carcass weight of a dairy cow is then estimated by using the live-weight for a dairy cow (LIC) and a dressing out percentage¹ of 44 percent.
 - IV. The average carcass weight of a dairy cow (step III) is then multiplied by the number of dairy cows slaughtered (difference between total cows slaughtered and estimated beef cows slaughtered – step II) to estimate the total weight of dairy cows slaughtered.
 - V. The difference between total weight of dairy cows slaughtered (step IV) and the total weight of cows slaughtered (slaughter statistics) is assumed to be total weight of beef cows slaughtered.
 - VI. The average carcass weight of a beef cow is then estimated by dividing the total weight of beef cows slaughtered (step V) by the estimated number of beef cows slaughtered (step I).
 - VII. Liveweight of a beef cow is then estimated by using a dressing out percentage of 45 percent and the average carcass weight for a beef cow (VI).
10. In 1989/1990 this gave a beef cow live weight of 392.5 kg and in 2009/2010 a live-weight of 451 kg.

Report

11. As part of the Inventory research program, a review of the current assumptions around breeding animal weight was carried out as these weights have a major influence on the estimated emissions from agriculture.

¹ Dressing out percentage is a value used to estimate the carcass weight from liveweight or vice versa.

12. Data suggests that the estimated cow liveweights maybe underestimated. This may be due to the many assumptions used to estimate the beef cow liveweight. The proposed changes result in cow weights more in line with beef cow weight data.

Proposed changes to inventory

13. The report recommends that a beef cow liveweight of 547 kg for the 2009/2010 season and an annual increase of 8.5 kg/year be used. This gives a liveweight value of 402.5 for the 1990/1991 season.

Implications to emissions estimates

14. Changing the dressing out percentage increases emissions from beef cattle in 1990 by 133 Gg CO₂e and in 2009 by 457 Gg CO₂e (2.1 and 7.2 percent increase in beef cattle emissions respectively). Agricultural emissions increased by 0.44 and 1.38 percent in 1990 and 2009 respectively.

Proposed changes to initial report and justification

15. The report was written in conjunction with another report titled “*Review of population models within the National Methane Inventory (2010)*”. The second report investigated other assumptions such as dressing out percentage.
16. The proposed methodology does not take into account between year variations. By changing assumptions in the current methodology to those recommended in the related report, values of 390 kg for 1990 and 559 kg for 2008/2009 are determined. These weights are in alignment with the recommended figures in the current report and annual variation in weight, especially those due to drought etc, will be picked up.
17. Assumptions from the related report which are recommended to be changed are:
 - I. dressing out percentage to 42.6 percent; and
 - II. the cow replacement rate changed from 25 to 17 percent.
18. Also, the dairy dressing out percentage is recommended to be changed to 42 percent which is slightly lower than the recommended dressing out percentage of beef. The inventory currently assumes dressing out percentage of dairy is lower in beef.
19. A spreadsheet is attached to demonstrate the changes to the time series.

Reviewer comment

20. The reviewer agreed on the recommended weights for 2008/2009 and 1990 that were proposed in the report for beef cow live weight. The alternative approach to obtain these values – detailed in paragraphs 15 to 19 – were also presented to the reviewer.
21. The reviewer noted that the rational of this alternative methodology makes sense especially in light of how recent droughts have affected liveweights. The reviewer also agreed that the current replacement rate of 25% is too high. They noted that they felt a replacement rate of 20% was more appropriate and then taking into account a

death rate of 2% would mean only 18% would be sold to be slaughtered. This value is in line with the 17% that is recommended.

Strategic Risks

22. The changes may not be accepted by the *United Nations Framework Convention on Climate Change* (UNFCCC) reviewers. However, if this is the case there is an extensive process which is followed in which New Zealand can state its case or change back to the IPCC default before any penalty would be applied.

Strategic Opportunities

23. New Zealand will be meeting the UNFCCC obligations of continual improvement of the National Inventory.
24. Emissions from New Zealand Agricultural Inventory will be calculated more accurately and models will more accurately reflect industry practices.

Recommendations

It is recommended that the Agricultural Inventory Advisory Panel:

25. ***Agree** that the current method to estimate beef cow weight be kept but that the following assumptions are changed*
- I. dressing out percentage for beef cows be changed to 42.6 percent;
 - II. dairy dressing out percentage be changed from 44 percent to 42 percent (slightly lower than that of beef), to harmonise with the reduction in dressing out percentage;
 - III. the cow replacement rate be changed from 25 to 17 percent.

Agree / not agreed

Andrea Pickering
Senior Policy Analyst

Approved/ Not Approved/ Approved as Amended

Alice Marfell-Jones
Manager Information and Analysis
Chair Agricultural Inventory Panel

Date