

# **The effectiveness of a chocolate incentive in a mail survey of New Zealand farmers**

*John R. Fairweather*

The effects of non-monetary incentives on response rate are well understood for surveys of the public but less well understood for surveys of business people. This research note reports the effect of a chocolate incentive on farmer response rates for a mail survey sent to random samples of farmers in the three main sectors of New Zealand primary production. The key results were a lack of a response rate increase for the questionnaire sent to the sheep/beef farmers and the horticulturalists and a modest increase in response rate for dairy farmers. The response rate effects were partially in line with expectations from the literature showing that non-monetary incentives are only moderately effective in surveys of farmers. Possible explanations of the higher response rate for dairy farmers are considered.

Keywords: surveys, response rates, non-monetary incentives, chocolate, farmers, New Zealand.

## **Introduction**

This research note examines the effectiveness of chocolate as a non-monetary incentive for improving farmer survey response rates. Declining response rate have been reported generally (Connelly, Brown & Decker 2003; Curtin, Presser & Singer 2005) and for farmers (Fairweather & Gossman 2004; Fairweather et al. 2007). While it is well documented that the most effective way to improve response rates is to increase the number of contacts (e.g., Dillman 1978) the use of incentives has also been shown to have a positive effect (e.g., Yu & Cooper 1983; Fox, Crask & Kim 1988; Pretolia & Bhattacharjee 2009; Brennan & Charbonneau 2009). Among these incentives are those of a non-monetary character but the evidence to date on this type of incentive is based mainly on surveys of the public and there is a need to clarify if they also work for businesses people, in this case farmers.

Research comparing the effectiveness of monetary and non-monetary incentives shows that monetary incentives are the most effective in increasing response rate. Church (1993) conducted a meta-analysis of surveys and found that while both types of incentive increase response rate, monetary incentives sent in the initial mailing increased response rate by an average of 19 percentage points. New Zealand evidence on monetary incentives is consistent with these findings. Brennan (1992) reported that a 50 cent incentive resulted in response rate increases of from 7-17 percentage points and advocated the use of a 50 cent incentive in the first mail out of the questionnaire in surveys of the public. Brennan et al. (1993) reported response rates from a 50 cent incentive for surveys of farmers responding to business-related questions and found a 14 percentage point increase after the first wave and an 18 percentage point increase after the third wave.

The evidence on the effect of non-monetary incentives on response rate is less convincing (Teisl, Roe & Vayda 2005) but Church (1993) found that non-monetary incentives can improve the response rate by eight percentage points on average.

The literature on non-monetary incentives has considered a wide range of inducements including, but not limited to, lottery tickets, scratch cards, phone cards, key rings, tie pins, postage stamps, tea bags, coffee sachets and chocolates (Brennan & Charbonneau 2009). Brennan and Charbonneau (2009) considered that among non-monetary incentives, chocolate has the most potential to improve response rates, especially in countries where it is not legal to post a monetary incentive. The effects of chocolate on response rate have received only limited documentation to date. Gendall, Leong and Healey (2005) reported response rate increases of 2.7 to 5.1 percentage points for a survey of the general public when a novelty chocolate coin was used. Similarly, Brennan and Charbonneau (2009) reported response rate increases of 7.3 percentage points for a survey of the general public when a foil-wrapped quality chocolate was used. The latter research also reported a response rate increase of 15 percentage points when the chocolate was used in conjunction with a reminder letter plus questionnaire, thereby ensuring people had good access to the questionnaire.

These studies of the effect of chocolate on response rate have been based on surveys of the general public. In the case of surveys of business people it can be assumed that they may well respond in the same way as the general public. However, on the available evidence to date, this is an assumption that has not been well documented. The purpose of this research note is to examine the effects of using a chocolate incentive on response rate, and to compare farmer response rates from the three main sectors of New Zealand primary production.

## **Method**

The results reported here derive from a national survey of farmers on attitudes to sustainability issues (Fairweather et al. 2008). The questionnaire covered a variety of topics including how the farmer or horticulturalist rated the importance of different measures of financial, production, environmental and social indicators, their approach to management, their social connections, their community participation, their views on bird diversity and management, and their views on the benefits from trees and shrubs. One of the main research objectives of the broader study was to compare the questionnaire results across the three main sectors in New Zealand primary production – sheep/beef, dairy and horticulture. Therefore, an appropriate research design was to take a random sample from each of these three sectors. Experience with Lincoln University surveys of farmers shows that the response rate has declined since 1977 (Fairweather & Gossman 2004). In an attempt to improve response rate the survey design included a chocolate incentive.

The chocolate was included with the covering letter to the questionnaire and the design compared the treatment groups to control groups who received the letter and the questionnaire only. While this constitutes a modest study of the effects of a chocolate incentive, the results are still valuable in that they contribute to our knowledge of the effects of non-monetary incentives on response rate and, in this application, response rate effects for business persons, in this case different types of farmers.

## **Sample**

Primary production in New Zealand includes a wide variety of farm types but most farms are included in the sheep/beef, horticulture and dairy sectors. According to AsureQuality (a company which has developed a comprehensive listing of farms in New Zealand as indicated by comparison to the official Statistics New Zealand data), these three sectors include 96 per cent of all farms. Similarly, the 2007 official statistics (Statistics New Zealand 2007) accounts for these three sectors as including 90 per cent of all farms. AsureQuality provided a simple random sample for each sector. The original sample size for each sector was 666 farms, a sample size chosen to give reasonable grounds for population inference traded against the costs of conducting the survey. A questionnaire was posted to each farm. Within each sector, 400 farmers received the incentive and the remaining 266 did not. These proportions derived from the discount obtained in purchasing over 1,000 chocolates, and by using at total of 1,200 chocolates meant that there were 400 for each sector.

## **Incentive**

The incentive was a small chocolate (43mm by 43mm by 4 mm) which cost 56 cents. The chocolate was referred to in the covering letter in the following way: 'The small gift included is our acknowledgement of your time and effort in filling out the questionnaire'. The chocolate was smaller than the Whittaker's chocolate (45mm by 55mm by 6mm) used by Brennan and Charbonneau (2009) and lacked quality name brand recognition. However, it was prepared by a rural business specialising in hand-made chocolates (whose name was on the back of the chocolate) and in choosing such a chocolate maker the survey could be seen as supporting a rural enterprise. Such a perception was thought to help the survey to be seen in a positive light and thereby encourage the farmers to respond. The chocolate was labelled as 'Farmer Survey 2008' with the Lincoln University name and logo also prominently displayed. The identification with the university was to reinforce that the survey was a Lincoln University survey and thereby add legitimacy to the study and provide further encouragement for farmers to respond. The chocolate was presented in an attractive black and gold wrapper. The chocolate was sufficiently thin to be able to pass through the New Zealand Post sorting machinery and remain intact, as indicated by a test sample posted to the principal investigator.

## **Procedure**

The questionnaires were posted out from 25-27 August 2008. A covering letter was included with all questionnaires along with a freepost return envelope. Also included was a brochure with information about a carbon credit calculator, developed by other staff in our research centre. On Tuesday, 7 October, a reminder post card was posted to all farmers who had not responded. The reminder was thus sent out 40 days after the questionnaire was posted, which is later than is normal and not the usual practice for mail surveying. This delay was in consideration of the farmers as business people who would have been particularly busy in the spring and may have seen early and numerous reminders as harassing them for a reply. The net effect of the reminder card was to stimulate responses from an additional three per cent of farmers, a low response probably due to the farmers no longer having the questionnaire.

## Results

The response rate for each sector was low, ranging from 18 per cent to 21 per cent (Table 1). The table shows the response rate for each sector with and without the chocolate incentive. Response rate was calculated by taking the numerator as all completed questionnaires and the denominator as the original sample number less the sum of those excluded for such reasons as having gone, having moved without leaving a forwarding address, no longer farming, or husband died.

While the incentive increased the response rate for all sectors, in the case of horticulture it was a marginal gain of 0.7 percentage points, for sheep/beef it was a gain of 3.7 percentage points and for dairy it was a gain of 5.8 percentage points. Chi-square tests show that only for the dairy sector was the increase more than would be expected by chance, and then only at the ten per cent level of confidence (chi-square = 2.70, 1 degree of freedom,  $p = 0.10$ ).

**Table 1. Response rates (%) by sector and with or without the incentive**

	Without Chocolate	With Chocolate	Difference	Chi- square
<b>Sheep/beef</b>	21.4	25.1	3.7	1.06
<b>Horticulture</b>	20.6	21.3	0.7	0.03
<b>Dairy</b>	18.4	24.2	5.8	2.79

In order to examine the effects of the low response rate a non-respondent survey of sheep/beef farmers only was commissioned and this showed that there was no evidence of obvious non-response bias. It also showed that, for 16 per cent of non-respondent cases, the person was no longer farming or was away when the questionnaire was delivered. An adjustment to the effective sample size increased the response rate to 28 per cent. This brings it into line with recent response rates for farmer recent farmer surveys which were 31 to 33 per cent in 2005 (Fairweather et al. 2007), although these surveys were not subject to the same adjustment.

## Discussion

Overall, the response rates were low and a number of considerations can be brought to bear on this result. First, as noted above in reference to the non-respondent survey, the original sample list included many cases where the farmer was no longer farming, reflecting inaccuracies in the list, or was away from the farm at the time of survey. Where the remaining member of the household sent the questionnaire back, and indicated that the farmer was no longer farming, then these were used to adjust the response rate. But the non-respondent survey showed that, for the sheep/beef sector, for 16 per cent of non respondents the person was no longer farming, reflecting inaccuracies in the farmer list, or was away. It is likely that a similar degree of inaccuracies or holidaying occurred for the other two sectors. Taking these considerations into account in calculating response rate brings the response rate up to

a more typical level. However, these considerations only apply if the number of these situations is different from that which occurred for the earlier surveys. While there are few data available to assess this issue, it may be the case that the list supplied byASUREQuality was not as accurate or as up to date as the more official sources used in earlier surveys. If the list was not up to date then there would be more cases of farmers who were no longer farming. This consideration suggests, more generally, that the declining farmer response rate over time may be, in part, a product of declining quality in the list of farm owners. The quality of the list would be hard to maintain if the level of turnover in properties is high, and this would appear to be the case in recent years.

Second, the low response rate was in large part due to the design of the survey which did not include regular, timely and repeated reminders to the farmers. Brennan and Charbonneau (2009) reported that their first reminder, sent 12 days after the first mailing, stimulated a 16 percentage point increase in response rate. With the 40-day delay in sending the reminder in this survey it is quite likely that the farmers no longer had the questionnaire and were therefore not able to reply even if they were inclined to do so. There is considerable evidence to show that including the questionnaire with reminder letters has a significant effect (Brennan 1992). Given that the questionnaire was only mailed out once, the low response rates are in line with what could be expected.

Third, the survey was posted out later than planned, not during the winter period which is likely to be a better time for farmers to respond to a questionnaire. The occurrence of severe winter weather meant that many pastoral farmers were preoccupied with flood recovery work. The mail out was delayed in recognition that many farmers were preoccupied and that a request to fill out a questionnaire may have been interpreted as insensitive. Because of this delay the questionnaire was received by farmers in early spring which meant that most were very busy with farm work, including flood repairs, and may not have been inclined to participate in the study.

Finally, the inclusion of the carbon credit calculator may have had an adverse effect on the response rate because, as the survey results subsequently indicated, a clear majority of farmers were greatly concerned about the emission trading scheme and they may have seen the calculator as implying that they should be supporting such schemes. Worse still, they may have perceived us as being supporters of the ETS and declined to respond to protest their anti-ETS position.

The key results relating to the use of a chocolate incentive for farmers in New Zealand was a lack of a response rate increase for the questionnaire sent to the sheep/beef farmers and the horticulturalists and a modest increase in response rate for dairy farmers. These results are only partially in line with our expectations from the literature. Non-monetary incentives have been shown in a meta-analysis of relevant research to increase the response rate by an average of eight percentage points (Church 1993) and the results reported here show that only for the dairy sector did the increase in response rate come close to expectations. The results are in more in line with those of Gendall, Leong and Healey (2005) who found that chocolate in the form of gold-foiled-covered coins increased response rates by 2.7 to 5.1 percentage points. The results suggest that chocolate incentives are partially effective and can have

positive effect on response rate. Where the positive effect occurs the increase for business or farmer surveys is likely to be similar to that obtained for surveys of the public.

The chocolate incentive had a modest and variable effect on response rates from New Zealand farmers. If we assume that the ten per cent confidence level for the significant chi square test is appropriate, then what would be a reasonable explanation for the higher response rate from the dairy farmers? Dairy farmers may have responded to the chocolate incentive for one of two reasons. First, the nature of the chocolate incentive itself - it was dairy milk chocolate - may have had a positive effect since it was a validation of dairy farming. Perhaps a gift made of wool, which might appeal to sheep/beef farmers, for example, would not have had the same effect on dairy farmers.

Second, and more speculatively, while the chocolate incentive is generally understood as a token gift, as communicated in the covering letter, it may be that dairy farmers saw it as a kind of payment as well. An issue related to the use of an incentive is the tone of the cover letter that makes a request to participate in the survey (Gendall et al. 1995). Typically, this request mentions the incentive but does so by referring to it as a token in acknowledgement of the contribution of the respondent. The incentive is understood by both the researcher and the respondent as not an item of value that equates to the time taken to fill out the questionnaire but an acknowledgement that time is taken. Thus, the incentive is not taken as a payment for the service provided.

If dairy farmers perceived the chocolate incentive as a kind of payment then this may suggest a possible explanation for its effect in their case. Since dairy farming is a well-measured farming activity with financial returns directly related to outputs on a day-to-day basis, all dairy farmers know for each day their exact level of production and therefore their return based on a known pay out per kilogram of milk solids. In contrast, sheep/beef farmers and horticulturalists have only indicative payment levels during the season and these are often subject to adjustment in the light of final sales data. In many cases they do not know their production figures until after harvest or at the end of the season. Dairy farmers are likely to be people who prefer the more direct link between production and returns.

If this is the case then the provision of an incentive may be more likely to lead to them thinking that it is reasonable to return a completed questionnaire for a modest incentive, even if it is a non-monetary one. Consistent with this view is the fact that the response rate for dairy farmers not receiving the chocolate incentive was the lowest at 18.4 per cent, suggesting that for some dairy farmers an incentive was necessary. This explanation is entirely speculative and it rests on assuming that dairy farmers saw the chocolate partially as a payment. A problem with this explanation is that the chocolate incentive, seen as a partial payment, does not appear to match the value of the effort required to fill out a questionnaire.

## **Conclusion**

The results reported here are only partially in line with the research on the effects of a chocolate incentive on response rate and are slightly more complex than expected. For the dairy sector at least, the increase in response rate of 5.8 percentage points was

broadly consistent with the eight percentage points expected from the literature but for the other sectors there was no real increase in response rate. The study indicates that non-monetary incentives are only partially effective for business people, in this case farmers.

The decline in farmer response rates in New Zealand is consistent with trends elsewhere and with no new countervailing factors these trends are likely to continue. Since there is strong evidence that monetary incentives are more effective than non-monetary incentives (Yu & Cooper 1983; Fox et al. 1988; Brennan et al. 1993), it would seem likely that a monetary incentive would be more effective than chocolate in surveys of farmers. However, in countries where it is illegal to post monetary incentives, this poses the challenge of finding an alternative to cash. The question of whether, in a survey of farmers, the effects of using a monetary incentive may be achieved by using phone cards or postage stamps, or other such items which have monetary value, remains to be tested.

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**John R. Fairweather is a Professor of Rural Sociology in the Agribusiness and Economics Research Unit at Lincoln University, New Zealand**

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