

## New Zealand Society of Animal Production online archive

This paper is from the New Zealand Society for Animal Production online archive. NZSAP holds a regular annual conference in June or July each year for the presentation of technical and applied topics in animal production. NZSAP plays an important role as a forum fostering research in all areas of animal production including production systems, nutrition, meat science, animal welfare, wool science, animal breeding and genetics.

An invitation is extended to all those involved in the field of animal production to apply for membership of the New Zealand Society of Animal Production at our website [www.nzsap.org.nz](http://www.nzsap.org.nz)

[View All Proceedings](#)

[Next Conference](#)

[Join NZSAP](#)

The New Zealand Society of Animal Production in publishing the conference proceedings is engaged in disseminating information, not rendering professional advice or services. The views expressed herein do not necessarily represent the views of the New Zealand Society of Animal Production and the New Zealand Society of Animal Production expressly disclaims any form of liability with respect to anything done or omitted to be done in reliance upon the contents of these proceedings.

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](http://creativecommons.org/licenses/by-nc-nd/4.0/).



You are free to:

**Share**— copy and redistribute the material in any medium or format

Under the following terms:

**Attribution** — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

**NonCommercial** — You may not use the material for [commercial purposes](#).

**NoDerivatives** — If you [remix, transform, or build upon](#) the material, you may not distribute the modified material.

<http://creativecommons.org.nz/licences/licences-explained/>

## **Continuing to increase productivity while maintaining our clean green image Introductory remarks**

J.I. KERSLAKE

AbacusBio, P.O. Box 5585, Dunedin 9058, New Zealand

An increase in intensive livestock farming can help our agricultural industry increase the production of more affordable food products. Unfortunately it can also have a negative impact on our environment and consequently the overall acceptance of our food products by the international consumer. To retain our position as leaders of premium quality agricultural food products, the New Zealand agriculture sector must find ways to increase production and profit on-farm while still maintaining our clean green image. This contract session will discuss the importance of sustainable food production from a market point of view, the role of legislation in improving farm sustainability at the farm level, and an overview of how scientific research is trying to find ways to increase agricultural output without increasing greenhouse gas emissions. Three examples of case studies which are looking at the trade-offs between production and profit and environmentally sustainability will also be presented.

## **The importance of sustainable food production for our markets**

M. BROWN\* and D. BUTLER

Alliance Group Limited, P.O. Box 845, Invercargill, New Zealand

\*Corresponding author: murrayb@alliance.co.nz

### **ABSTRACT**

New Zealand market advantage is at the “top-end” of value, in the production of sustainable, superior quality, highly valued protein. Enhancing our image as the “garden of the pacific”, will lead to greater opportunities for economic growth and a prosperous red meat industry, while at least maintaining, if not improving, our natural resources. This paper discusses what sustainable food production means and identifies some of the expectations of our international markets. The paper also briefly describes how Alliance Group Limited is responding to improving sustainable food production. Strategies outlined include improving farm practices, processing capabilities and improving quantity and quality of product.

**Keywords:** sustainable food production; markets.

### **INTRODUCTION**

Demand for protein is growing more rapidly than ever before due to increasing population and affluence in developing countries. However, the magnitude of global environmental issues means there is discord between how we produce our food and how we treat our resources. Sustainability issues are well documented for red meat production and within New Zealand, agriculture is responsible for 48% of our total greenhouse gas (GHG) emissions (Ministry for the Environment, 2010). Agriculture also contributes to over 50% of our total export earnings and will continue to be vital for the future prosperity of our country. So where do we at Alliance Group position ourselves on the global food market in order to keep the goose and the golden eggs?

New Zealand is not able to compete with developing countries in the mass production of low-cost protein. Instead, our market advantage is at the

“top-end” of value, in the production of sustainable, superior quality, highly valued protein. Enhancing our image as the “garden of the pacific”, will lead to greater opportunities for economic growth and a prosperous red meat industry, while at least maintaining, if not improving, our natural resources.

In this paper we will discuss what sustainable food production means to us as red meat exporters and identify some of the expectations of our international markets. We will also describe the responses Alliance Group Limited is making in the context of the greater New Zealand response.

### **WHAT DOES SUSTAINABLE FOOD PRODUCTION MEAN?**

Sustainability is a fourteen letter word with 1,400 meanings and still counting. The Resource Management Act (1991) defines sustainable production as, “the use and development, and protection of natural and physical resources in a way

or at a rate which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety...". A simpler expression of the concept would be; "Meeting the needs of the world's population without adversely affecting future generations, not just meeting the needs, but also balancing environmental, social, and economic concerns and expectations."

Typical topics that fall within the sustainability spectrum are found in Table 1. The scope of this paper allows us to focus on the climate change aspects of the sustainability spectrum, while the Alliance Group is working to ensure that all components of sustainability are part of our current and future planning.

## SUSTAINABLE EXPECTATIONS OF THE MARKET PLACE

Many major supermarkets in the world are working to develop sustainability programmes and associated food labelling which demonstrate to their customers that products have been produced in an environmentally-friendly manner. Some supermarkets are even encouraging their customers to ensure they are familiar with the sustainability practises they are promoting when they purchase their food. Three examples of the type of commitments that United Kingdom supermarkets are making can be found below:

### **TESCO**

"We now know that the implications of climate change are huge. I am not a scientist. But I listen when the scientists say that, if we fail to mitigate

**TABLE 1:** Typical topics that fall within the sustainability spectrum.

Sustainability topics
Water allocation and use
Pollution prevention
Fertiliser use
Biodiversity
Packaging and labelling
Food safety
Ongoing supply
Nutrition
Landscape value
Greenhouse gas emissions
Animal welfare
Genetic modifications
Health and safety
Profitability
Product freshness and quality
Healthy balanced diets
Product integrity

climate change, the environmental, social and economic consequences will be stark and severe. This has profound implications for all of us, for our children, and for our children's children. I am determined that Tesco should be a leader in helping to create a low-carbon economy. In saying this, I do not underestimate the task. It is to take an economy where human comfort, activity and growth are inextricably linked with emitting carbon and to transform it into one which can only thrive without depending on carbon. This is a monumental challenge. It requires a revolution in technology and a revolution in thinking." (Leahy, 2007).

### **Sainsbury**

"We are committed to reducing our impact on the environment and aim to be leaders in the United Kingdom for environmental innovation." (Sainsbury, 2010).

### **Marks and Spencer**

"Work with food suppliers to ensure that all factories have an environmental action plan, so that by 2015, 25% of Marks and Spencer Food (by turnover) will be produced by factories that have improved energy efficiency by at least 20%."

"Reduce the impact on the natural resources used to make our products: Continue to work with Marks and Spencer suppliers and specialists to monitor and further improve animal health and welfare standards using the Marks and Spencer TRAK system." (Marks and Spencer, 2010).

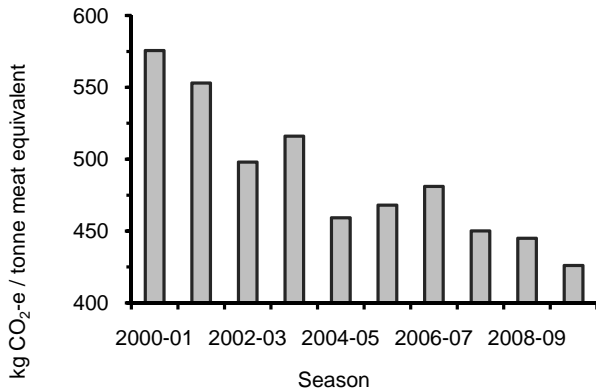
## ALLIANCE GROUP'S RESPONSE TO SUSTAINABLE FOOD PRODUCTION

For more than 10 years Alliance Group has been implementing a strategy of continuous investment to improve sustainable food production. Strategies have included improving farm practices and processing capabilities, securing livestock supplies for the future and improving quantity and quality of product. These strategies have been supported by an investment programme that encompasses all parts of the supply chain from behind the farm gate, through to transportation, slaughter, processing, and delivery to the customer. Some of the initiatives and programmes that have been introduced include environmental management programmes, and investment and participation in industry-level projects (D. Butler, Unpublished data).

### **Environmental management programmes**

Comprehensive environmental management programmes are embedded throughout the company. Alliance Group and all its nine processing plants are certified to the Enviro-Mark® NZ Diamond level and ISO 14001 environmental management standards (ISO, 2011). Traditional environmental

**FIGURE 1:** Carbon dioxide equivalent (CO<sub>2</sub>-e) emissions from energy use at Alliance Group processing plants from 2000-01 processing season to 2009-10.



issues like wastewater treatment and discharge, water takes and discharges to air are covered by resource consents granted by regional councils. There is a significant focus on reducing water used in all the processing plants. Similarly, waste minimisation and recycling programmes are in place at all sites. As an entry point to accounting for GHG emissions we have reviewed and managed the GHG emissions from the energy used in our processing plants for more than a decade. GHG emissions have reduced by 26% per modified unit of production since 2000 and are still reducing year on year (D. Butler, Unpublished data) (Figure 1). Factors which have contributed to this positive outcome include; adoption of shift work, increased trade in chilled lamb, increased average carcass weights, upgrading of processing plants, and participation in specific energy conservation audits and projects.

From this initial work we have rolled out

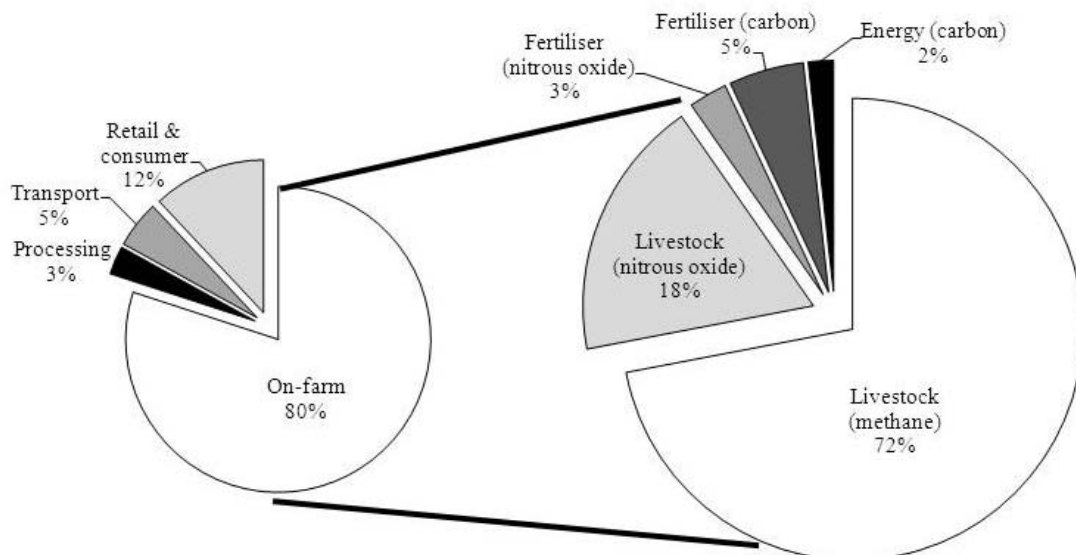
weekly performance reporting for electricity, fuel and water-use per unit of production for all of our plants along with targets for improving performance. These energy use reports are expressed in terms of GHG emissions per unit of production. The work has prompted several new capital expenditure projects that will result in further energy and emissions efficiency improvements.

**Participation in industry level projects**

At an industry level we have participated in a Ministry of Agriculture and Forestry sponsored GHG footprint study for New Zealand lamb sold in the United Kingdom, and a GHG footprint study for New Zealand beef sold in the USA and Asia. These studies are the first to determine the GHG footprint of red meat using the new PAS 2050 methodology from the farm to the plate. The lamb study showed that 80% of the overall footprint was from emissions on-farm with 3% emissions coming from the processor, 5% from transport and 12% from the retailer or consumer (S.F. Ledgard, Personal communication). This study showed that the biggest challenge is to reduce GHG emissions on-farm (Figure 2).

In conjunction with AbacusBio Limited, we have also developed Alliance Group Hoofprint®. Hoofprint is a software model which determines on-farm carbon footprints of New Zealand sheep and beef farming systems (Sise *et al.*, 2010). The model allows Alliance suppliers to develop a carbon footprint of their operations as a means of measuring and managing GHG emission performance of the farm. The model will be extended to include GHG emissions calculated for the New Zealand emissions trading scheme from stock processed by uploading killing sheet data. At

**FIGURE 2:** The average life cycle analysis footprint of lamb from pasture to plate.



present there is no provision in the New Zealand emissions trading scheme to recognise good performance or low emissions, at the farm level as the emission factors apply uniformly across the country at processor level. However, it will be possible to develop unique emission factors for farms or groups of farms that can demonstrate superior performance, or the adoption of proven measures to reduce emissions.

In conjunction with AgResearch, Sheep Improvement Ltd. and AbacusBio Ltd., we funded the setup of the central progeny test programme in 2002 (Young & Amer, 2003). The CPT operates as a ram progeny comparison programme to examine how industry rams vary in growth rate and carcass merit. The programme uses the sophisticated VIAscan® carcass assessment tool that is installed at Alliance Group plants. The central progeny test programme is now funded by Beef and Lamb New

Zealand as an industry programme. As part of the central progeny test, rams are being assessed for variation in GHG production with the ultimate aim of being able to select rams that are top producers and have the lowest GHG production.

## CONCLUSIONS

The key challenge for us and our shareholders is how do we farm sustainably and remain profitable? We do not have all the answers and much needs to be debated at national and international levels. What we are doing though, is steadily building our research and development programme, our production systems and our marketing programme to incorporate sustainability at all levels of our business. Sustainability, that 14 letter word, with so many meanings and so many opportunities

## The role of legislation in improving farm sustainability and how the New Zealand Government intends to incentivise the agricultural industry

E.H. VAN REENEN\* and A.H. PICKERING

Ministry of Agriculture and Forestry, P.O. Box 2526, Wellington, New Zealand

\*Corresponding author: erica.vanreenen@maf.govt.nz

### ABSTRACT

The New Zealand Government has put in place a number of mechanisms aimed at improving farm sustainability and incentivising action. In relation to climate change, the key mechanism is the New Zealand Emissions Trading Scheme (ETS), which has been designed to put the New Zealand economy on a path to lower greenhouse gas (GHG) emissions and to respond to the country's international obligations. Although all developed countries that have ratified the Kyoto Protocol are responsible for their agricultural emissions, New Zealand is the only country in the world to include agriculture in an emissions trading scheme. With the inclusion of agriculture there are three key ways to incentivise a reduction in GHG emissions on-farm. These are through the point of obligation, the emission factor methodologies, and the allocation of "New Zealand Units" to the sector. Introducing agricultural GHG emissions into a New Zealand emissions trading scheme brings with it challenges and opportunities in a country that is heavily reliant on primary production for the health of the economy.

**Keywords:** agriculture; allocation; emission factor; greenhouse gases; New Zealand emissions trading scheme; point of obligation; processor; sustainability.

### INTRODUCTION

New Zealand's economy is closely linked with its natural and physical resource base. Agricultural and forestry commodities made up 64 percent of merchandise export trade in 2009 and 12% of gross domestic product (Ministry of Agriculture and Forestry, 2010). Therefore, New Zealanders, particularly the primary sector, have a strong incentive to ensure that the natural environment is used sustainably.

There are a range of government tools and instruments relating to sustainable development that have been implemented to address issues such as water, climate change, land management, energy, transport policy, and waste management. Examples of these include the Resource Management Act 1991, the Sustainable land management and hill country erosion programme, the New Zealand energy strategy, and the New Zealand emissions trading scheme (NZETS). To address climate