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Chapter 11

Cardio, Climate, Coping and Crops: Connecting Conditions in Farming Communities

Susan Brumby

Introduction
Engaging farm men and women (particularly men) in health, well being and safety issues is not a meagre goal. Neither is engaging the farming community (or any community for that matter) in the big and sometimes nebulous issues of climate change. This is despite the fact that living and working in rural communities may jeopardise your health outcomes and that farm fortunes are inextricably linked to and tied to climate. Coming face to face with personal illness or injury or continued unseasonal low rainfall does not mean that understanding, acknowledgement and adaptation are forthcoming in either the health of self or in making appropriate adjustment to address declines in farm production. Personal vulnerability or experience does not necessarily equate into easier engagement to address both these critical issues.

Living in a rural community is associated with higher rates of avoidable death and illness through heart disease, cancer, diabetes, injury and suicide. In a farm family business, the effects of poor health, unhealthy lifestyle, and work life imbalance impact not just on the farm business but the family unit, the farm environment and their farming community. Similarly, the recent climate extremes experienced in Australia are also having substantial effects on farm businesses and farmer health, as the link between successful farming and predictable rainfall patterns brings farm men and women face to face with the reality of climate change. Farm businesses need to adapt to the changed and changing conditions in an environment of unprecedented uncertainty and undergo significant adjustment of production systems, for example, changing from a grazing to a cropping enterprise. As a consequence of farming enterprise change, communities once reliant on grazing and livestock production will also transition and change with further adjustment predicted (Barr, 2005).
Recognising that health is not just the responsibility of the health sector, Western District Health Service, based in Hamilton Victoria developed the Sustainable Farm Families (SFF) program to work with farmers, families, industry, health services and universities to collaboratively address and improve the health, well being and safety of farm families. Initial funding was sourced from the Joint Research Venture for Farm Health and Safety managed by the Rural Industries Research and Development Corporation in 2003. SFF uses a social learning and health promotion framework to engage with farm families as active learners where they commit to healthy living and safe working practices. Farm men and women participating in the SFF reported changes and improvements in their health and safety behaviours, with evidence of sustained improvement in clinical indicators over three years with a reduction in risk factors for chronic diseases such as diabetes and cardiovascular disease (Brumby and Wilson et al, 2008).

Poor health outcomes and climate change have serious and direct impacts on both farm families' well being and profitability, but this does not automatically lead to easy engagement with farmers on these confronting issues. As reported by Birchip Cropping Group in their report Critical Breaking Point (2008) the impact of drought actually stalls decision making for many farm families which they aptly described as the 'pause mode'. However, early work by Hounsome (2006) shows that good physical and mental health, enhances decision making and the adoption of agri-environmental management schemes and practices suggesting that by continuing to improve health, wellbeing and safety outcomes, farm family capacity for change increases. This would suggest that the success of Sustainable Farm Families will enhance farm men and women’s ability to engage and adapt to climate change.

This chapter outlines the Sustainable Farm Families project, its methods and capacity to improve the health, wellbeing and safety of farm families. Outlining the culture of current rural health practice, the impact of farm family health, characteristics of SFF participants and the changes in their health outcomes and behaviours, this chapter will illustrate the effectiveness of social learning, drawing on the application of the five braided strands as described by Keen, Brown and Dyball (2005). This approach adopted and embraced by the Sustainable Farm Families has much to offer policy makers in how to move forward from
the ‘pause mode’ and engage with individuals, families, agribusiness and communities in the climate change challenge.

Social Learning and Health Promotion

According to Keen et al (2005, p. 6), ‘our social and ecological sustainability depend on our capacity to learn together and respond to changing circumstances’ and that many of our current approaches to learning and responding to change occur within traditional institutional arrangement and values. In this traditional arrangement the farming business and the health and wellbeing of farm family members would seem as quite separate parts although tied through its very structure as both an economic and emotional relationship. Typically the agricultural business side is attended to by agricultural departments and agribusinesses and health by the health services and general practitioners. At the commencement of the SFF program the need to pull together the farm family business elements of health and wellbeing, farm safety and the sustainability of the farm was recognised by the program initiators including health, agriculture, education sectors and farm industry groups. These initiators highlighted the need for an innovative approach to assist in addressing the relationships between these elements and therefore increasing our ability to understand and address the issues of chronic disease, health and wellbeing, farm family sustainability and more recently climate change (Brumby and Wilson et al, 2008). Utilising both social learning approaches and health promotion interventions as described by Keleher and Murphy (2004) SFF was able to develop a program that created opportunities for people to develop the personal skills required for good health, wellbeing and safety, manage change and the challenges of everyday farm life.

The Ottawa Charter for Health Promotion (World Health Organisation, 1986) which has led the health promotion movement globally defines health promotion as:

The process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social wellbeing, an individual or group must be able to identify and to realise aspirations, to satisfy needs, and to change or cope with the environment. Health promotion is not just
the responsibility of the health sector, but goes beyond healthy lifestyles to wellbeing. (World Health Organisation, 1986, p. iii)

Health promotion interventions range from population based approaches such as screening, risk assessment, immunisation and social marketing (e.g. media campaigns for SunSmart) through to local health education programs (e.g. healthy school canteen programs) to system and policy changes (e.g. legislation to wear seatbelts). Keleher and Murphy (2004) suggest that SFFs immediate goal of providing information to farm families and groups, with the aim of improving knowledge, attitudes, self-efficacy and their capacity to change as a downstream-midstream health promotion intervention where changing policy is an upstream intervention.

**Health care culture**

Healthcare and health services are predominantly viewed through the traditional biomedical culture with health care providers providing health information and services focused on disease and cure. Much of the health system is shaped around practitioners providing short consultations as they earn income from fee for service and are provided where populations cluster. Health services such as hospitals have much of their incomes and infrastructure derived from health interventions either as inpatients or short stay surgical services, that is people come in and have something ‘done to them’ by the health service which usually matches a set of required funding targets. This traditional and medicalised foundation has also influenced the newer practice of community and primary health which has evolved around health professionals giving ‘targeted talks’ in the community with the intention of filling ‘empty vessels’ (our patients) with knowledge and skills (Freire, 1970). This reflects the tradition of our health education system where understanding how people learn has not been part of the health curriculum and is not assessed during practice reflection tending to focus on the medical outcome. Ison (2005) comments that a tradition in a culture embeds what has been judged to be useful practice and becomes a blind spot to further critical reflection. Current evidence from both social learning and health promotion practice informs us that the approach used can either stifle or encourage the attainment of
knowledge by population groups and their capacity to change (Wass, 2001). Capacity to change is a vital aspect when considering personal behaviour changes to improve health, wellbeing or safety or similarly changes and adjustment in farm production.

Farm Family Health – a four pronged impact

Poor farmer health is to some extent preventable and early intervention and health maintenance has flow on benefits, not only to profitability but to family and rural community members in the long term. Impacting on the health and wellbeing of families, the farm and the wider rural communities is an investment for us all. Understanding the attitudes and abilities of the Australian farming population is pivotal to affect positive outcomes to health and well being. The underlying characteristics of the farming family unit include; a strong work ethic, lower socio-economic status, high level of injury, risk taking behaviours and higher per capita levels of disease rates and morbidity in rural populations. The agricultural workforce is relatively old, with over 70 per cent aged 35 years or older in 2003 – 04 compared to 58 per cent for the rest of the economy and work an average of 50 hours per week compared to 42 hours for the total workforce (Productivity Commission, 2005). They also work longer hours than other workers and rely on family workers as labour sources impacting on their ability to get away from the farm particularly in the dairy industry (Todd, 2006).

The mental health and wellbeing of farming communities is also of concern. Suicide rates across most age groups for men are higher in rural and remote centres (and for women in the 30 to 44 year age group) with deaths from suicide of male farmers and farm workers now double that of any other group in the male population (Caldwell et al, 2004). What is noteworthy is that the incidence of mental illness, particular depression and anxiety are not higher in rural areas; rather it is the outcomes for these illnesses (such as suicide) that are much higher in rural areas. Mental health, physical health and wellbeing have all been compounded by the extremes of climate with prolonged drought extending across much of southern Australia. These events have a significant effect on the family unit and extended community and stall decision making rather than triggering it due to its insidious and
monotonous continuation (Birchip Cropping Group, 2008). As shown in Figure 11.1 below farmer health is a complex issue that has an effect on the farm, farm family and farm community.

![Diagram of Farmer Health and Impact](image)

**Figure 11.1: The flow on effect of poor health on farmers, families, farms and communities (Brumby 2005)**

**Climate change and farm families**

A report commissioned by the Climate Institute says that by 2020 Australians will be suffering increased rates of heat stress, allergic diseases and depression because of climate change (Horton and McMichael, 2008). The report also predicts increases in food poisoning, respiratory disorders and mosquito-transmitted diseases. The Victorian Council of Social Services (2007) has identified the impacts of climate change will affect the most disadvantaged and vulnerable groups in Australia. These groups are likely to include the elderly, the chronically ill, the socio-economically disadvantaged, indigenous communities, those with poor access to essential services (good housing and adequate fresh water), and those whose economic prosperity depends heavily on climate for their livelihood (Fritze, 2007). As highlighted by Fritze (2007), farmers, farm families and agricultural workers are likely to be substantially affected by climate change. Predictions from ABARE (2007) in its assessment of climate change in Australia include a rise in drought affected areas, increased warm spells and heat waves, changes in locations where cropping can take place, less water availability and increased salinity of irrigation water to name a few.

On a global scale there are predictions of severe food security as already seen across the globe with reports of the smallest amount of
wheat held in stores for a decade (Leake, 2008). In June 2008, the United Nations held a crisis summit on rising food, water, fuel and fertilizer costs further squeezing already stressed aid budgets that have been exacerbated by increasing weather disasters. The Australian Council of Deans of Agriculture are also urging Australia to address the looming global food shortages noting that there is a limited and diminishing supply of agriculture graduates to meet these significant challenges (Meacham, 2009). Attracting graduates to agriculture is difficult when good health, lifestyle and safety are an important part of vocational choice. It is not easy to imagine being attracted to an industry with poor health outcomes, high suicide rates and limited access to services. Whilst the actual impacts of climate change will be strongly influenced by local environmental and socio-economic factors, there is no doubt that adaptation will need to be made to reduce the full range of these impacts in our communities.

**Method-social learning in practice**

Sustainable Farm Families works with farm men and women over three years using annual health assessments, education on topics such as cardiovascular disease, cancer, diabetes, stress, gender issues, diet and nutrition, depression, anxiety and physical activity and group discussions during each topic. It also provides a 20 – 30 minute one on one discussion to allow for closer examination of the participants clinical results.

In 2003–04, 338 farm men and women consisting of 210 dairy farmers and 128 mixed farmers (cropping, grazing, wool) from sixteen locations across Victoria and one in South Australia participated in the SFF program. Participants were self selecting and usually came as part of an industry group. Two hundred and fifty one participated in all three years of the workshops equalling a retention rate of 74.2 percent. The average age across workshops is late forties with the age range of participants from twenty to seventy six years. Most participants were experiencing one or all of the following: shortage of water, extended drought and changes to irrigation water allocations (Brumby et al, 2006; Brumby et al, 2008). All had been farming for at least five years and these participants form the basis of this chapter (see Table 11.1).
Table 11.1: SFF Farm Participants from 2003-04

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of participants</th>
<th>Percentage of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>179</td>
<td>53%</td>
</tr>
<tr>
<td>Female</td>
<td>159</td>
<td>47%</td>
</tr>
<tr>
<td>Born in Australia</td>
<td>316</td>
<td>93.5%</td>
</tr>
<tr>
<td>Current smoker</td>
<td>20</td>
<td>6%</td>
</tr>
<tr>
<td>Previous smoker</td>
<td>69</td>
<td>20%</td>
</tr>
</tbody>
</table>

**SFF and social learning**

In the SFF program health education and information is provided to farm families using a workshop format with participants reporting positive impacts on their farming business. Participants commit to attending 3 workshops (four days) over two years. SFF sits comfortably across generations and sexes and has a high level of support with participants saying they would recommend the program to other farm families (Brumby et al, 2006). The workshops have an egalitarian atmosphere, open communication, small group work and sound facilitation which are demonstrated as important factors.

**Reflection and reflexivity**

In developing SFF, health promotion, adult learning and social learning principles were used to inform and formulate a new approach. Azjen and Fishbein’s (1980) theory of ‘reasoned action and planned behaviour’ guides the learning experienced by participants in the SFF projects and ensures that reflexivity – reflecting on the learning as described by Keen (2005) is part of the learning process.

Adult learning and social learning theory suggests that behaviour changes in this SFF program occur through

- the sharing of values and beliefs about health of the farming peer group
• a common commitment to individual physical and knowledge assessment
• sharing with peers how best to influence health outcomes, and
• understanding the consequences of poor health and safety behaviour on farming families.

The training and delivery model is based on Kolb’s (1984) learning cycle, which allows participants to follow a systematic approach to identify and comprehend new information. Kolb’s model uses the principle that individuals reflect on their own experiences, acquire new concepts and actively experiment with new ways of working which becomes part of their experience base. This learning is supported with videos, graphs, statistics, and reflection on one’s own lifestyle.

As outlined by Brumby, Martin and Willder (2006) these processes of reflection are essential for farming families and allow particular focus on issues such as farm health and safety, the role of good farm practices and the effects on the farming family unit. This process has allowed participants to use the experience and support of their peers to make informed choice and identify behaviours that effect farming family health.

**Systems orientation and systems thinking**
The SFF project involves key industry groups (not just health) to assist in the early adoption of the health, wellbeing and safety practices advocated in the program. It also encourages active participation by numerous members of the same farm business unit. Farm families are asked to reflect on the links between themselves, their farm business and their family, which as outlined by Keen et al (2005) allows for both human and non human elements to be included as parts of the given system - in this case, family, health and wellbeing and the farm. This thinking also reinforces the SFF tag line of ‘the human resource in the triple bottom line. ‘The triple bottom line’ includes the three areas of financial, environment and human resources required for a successful farming business and moves understanding towards a system orientation where both the human and non human elements are included and considered in practice.

In the third year of SFF a survey was undertaken regarding the impact
of SFF on farm decision making with 86.3 percent of participants indicating that improving their health helped them make better business decisions. This is further reinforced and supported by Hounsome et al (2006) findings that variables relating to farmer health and wellbeing were identified as significantly affecting the odds of agri-environmental schemes being adopted by farmers further highlighting that systems orientation and systems thinking is necessary. SFF also prompted them to think ‘differently about managing their work on the farm’ and that this extended to outside the ‘traditional items’ of the farming business as illustrated in Figure 11.2 below.

![Figure 11.2: Has the SFF program prompted you to think differently about managing work on the farm?](image)

These changes in thinking differently about managing work on the farm reinforce the message that consideration of the business context, environment and the family situation is required. Importantly reflection on the linkage between the health of the farm family, their farm system and their farm business assists participants to see that constraint between the parts affects the system as a whole (Keen et al, 2005). Thereby improving health and wellbeing (a constraint on the system) can positively affect the system as a whole.
**SFF and integration and synthesis**
Groups that are involved with SFF are mostly industry driven and meet to discuss production or policy issues such as Farm Management 500, Best Wool 2010 and the United Dairy Farmers group. In the early stages of SFF these participants would have been known as innovators in farm management and be considered ‘early adopters’ in Roger’s (1983) typology. Of more recent years other groups such as the local football and netball clubs, the Country Fire Authority, Landcare and horticultural groups have identified participants and sought to have a SFF workshop run in their community. This too has worked successfully, although may not fit into Rogers early adopters typology. Watt’s (2007) research instead shows that the key requirement for broad propagation of a concept through networks occurs via a critical mass of ‘easily influenced people.’ Via this theory, adoption and trends are not led by a few influentials as defined by Rogers (1983), but rather through many easily influenced individuals. Watts argues that news travels as readily through ordinary people as influential ones. This means that our world is not just ‘hub and spoke’ but that networks are vast and democratic. That is we are just as likely to ‘get the news’ from a friend as from an ‘innovator’ (Watts and Dodds, 2007). This view would be reinforced by our current learning for the SFF programs and the industry groups with which SFF has worked. SFF has now also engaged with local caterers and fund raising groups, such as parent and friends and historical societies, who are now also working with, learning about and recommending through word of mouth about SFF in their community.

Keen et al (2005) suggests that the most popular sustainability model is one of overlapping circles depicting the intersections of social, ecological and economic systems (the triple bottom line) and points out that it infers that sustainably only occurs at the intersections of the three points. Whilst integration is difficult to diagrammatically illustrate, SFF manages to work at both the operational level (running a SFF program in your local community) with integration and synthesis occurring through intersections of sectors (health, government, industry) usually represented by health professionals, Department of Primary Industries, social sciences staff and members of the local farming group working together. Importantly running a SFF program in a community also
utilises local infrastructure, for instance the hall and local resources and services such as parents association for catering and family day care for childcare support. This is diagrammatically outlined in Figure 11.3 with the bees representing taking the knowledge and experience of SFF back to individuals own area of work and community.

![Diagram of SFF integration and synthesis in a local community](image)

Figure 11.3: SFF integration and synthesis in a local community
Source: (Brumby 2008)

At a strategic level the same approach of integration is used but at a different scale - that is with 1700 farm men and women and more partners and communities with each petal intersecting with other petals in the centre.

**SFF and negotiation and collaboration**
Health is most effective when it involves integrated interventions that are supported by the health sector, industry and other community partners. In the context of strengthening community action and empowering individuals, social capital is an important contributor to the health and wellbeing, and the effects of health promotion programs. There are many factors and pressures that interfere when working with
farmers - they are often isolated, (geographically, socially, access to services, IT, telecommunications), the work place is frequently the home and as a group recognised and culturally promoted 'as being stoic'. As these pressures increase so has the strain on communities, farmer groups, health and government to ‘do something about their health and safety.’ SFF has worked across and with sectors to ensure intersectoral collaboration was a key part of all its processes. This fits with Keen et al (2005) social learning braid of negotiation and collaboration - using different communities, professions and agencies for their knowledge and skills.

The SFF workshops are also evaluated by the farm men and women using Kirkpatrick’s (1998) training evaluation framework. This approach to evaluation includes four levels and is carried out over three years.

- **Positive experience** - evaluate reaction of participants
- **Conceptual understanding** - evaluate learning of participants
- **Can the learning's make a difference** - evaluate behaviours of participants
- **Demonstrable outcomes** - evaluate results of the workshop

SFF health professionals and facilitators are benchmarked against the topics they present with feedback and ongoing education to assist with improving the SFF program. These results are reported back to the steering committee with discussion and negotiation about ways to improve and adapt the SFF program with changes being implemented and then reevaluated through negotiation and collaboration.

Ongoing consultation, evaluation of all SFF programs to encourage feedback and constructive criticism, across all the SFF sectors (including the Office for Climate Change) have continued since SFFs commencement. This approach has allowed numerous pathways for farm participants, government, lobby groups, health professionals and academia to present competing opinions and to assist the SFF to address conflicts and consider new ways of learning and participating in SFF.
**SFF Participation and Engagement**

The big ticket items in Australian public health are cardiovascular disease, cancer and diabetes. Having farming people participate and engage on addressing these issues makes good sense as the impact of these conditions is projected to be enormous both in human and economic terms and for farming people already geographically isolated, prevention and access to information is important. Rural people already experience higher rates of many cancers and poorer outcomes once diagnosed (English et al, 2007) and the increased and spreading incidence of diabetes across Australia is also well documented (Access Economics, 2008). Data were collected from the SFF participants as a baseline and 12 months and 24 months on key personal health indicators including weight, waist hip measures, body mass index, fasting blood glucose, cholesterol levels and blood pressure as well as self reported surveys (see Table 11.2).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (range)</td>
<td>48.08</td>
<td>10.20</td>
<td>20</td>
<td>76</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>27.44</td>
<td>4.36</td>
<td>17.6</td>
<td>45.6</td>
</tr>
<tr>
<td>Total cholesterol (mmol/L)</td>
<td>5.13</td>
<td>1.022</td>
<td>3.50</td>
<td>8.00</td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>95.6</td>
<td>13.1</td>
<td>91.18</td>
<td>10.79</td>
</tr>
<tr>
<td>Blood glucose level (mmol/L)</td>
<td>5.03</td>
<td>0.748</td>
<td>2.8</td>
<td>11.5</td>
</tr>
<tr>
<td>Blood pressure (systolic) (mm Hg)</td>
<td>129.47</td>
<td>15.87</td>
<td>90</td>
<td>195</td>
</tr>
<tr>
<td>Blood pressure (diastolic) (mm Hg)</td>
<td>81.36</td>
<td>9.38</td>
<td>60</td>
<td>120</td>
</tr>
</tbody>
</table>
The emphasis on systematic collection of health data enabled careful monitoring of changes in the key health indicators and for engaging in learning partnerships with the SFF participants. Amongst the SFF participants, a pattern of risk emerged. The numbers of participants at risk in terms of particular clinical indicators are shown in Table 11.3. These indicators are used to determine risk for diseases such as cardiovascular disease, diabetes and more recently cancer.

Statistically significant \((p \leq 0.05)\) mean changes over 12 and 24 months were identified in a range of clinical parameters for the whole cohort, including body mass index, systolic blood pressure, total cholesterol level and waist circumference. Mean changes in clinical parameters for those considered ‘at risk’ in the base year were also highly statistically significant. Those at risk achieved greater mean reductions in all the five clinical parameters. This is illustrated in Table 11.3.

### Table 11.3: Mean change in clinical parameters from baseline to year 2 for all at risk participants that attended both programs

<table>
<thead>
<tr>
<th>Participants \textbf{at risk} in base year that attend all three workshops.</th>
<th>Year 2 Mean ((\pm\text{Standard Error}))</th>
<th>Year 3 Mean ((\pm\text{Standard Error}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body mass index (n = 168) At risk (\geq 25)</td>
<td>(-0.384 (0.0866)^{**})</td>
<td>(-0.247 (0.0898)^*)</td>
</tr>
<tr>
<td>Total cholesterol (n=95) At risk (\geq 5.5) mmol</td>
<td>(-0.723 (0.0955)^{**})</td>
<td>(-0.847 (0.0986)^{**})</td>
</tr>
<tr>
<td>Total Blood glucose ((n=37)) At risk (\geq 5.5) mmol</td>
<td>(-0.255 (0.1246)^*)</td>
<td>(-0.324 (0.0782)^*)</td>
</tr>
<tr>
<td>Blood pressure (systolic) ((\text{mm Hg}) (n=85)) At risk (\geq 140) mm Hg</td>
<td>(-7.000 (1.104)^{**})</td>
<td>(-11.235 (1.318)^{**})</td>
</tr>
<tr>
<td>Blood pressure (diastolic) ((\text{mm Hg}) (n=73)) At risk (\geq 90) mm Hg</td>
<td>(-5.616 (0.839)^{**})</td>
<td>(-8.463 (0.837)^{**})</td>
</tr>
</tbody>
</table>

Significant values \(^{***} p \leq 0.001, ^{**} p \leq 0.01, ^{*} p \leq 0.05\)
Statistically significant changes (improvements) were identified for a range of clinical parameters for those people at risk in those clinical indicators which relate in particular to cardiovascular disease, diabetes and hypertension, mainly preventable and modifiable conditions.

**Actions to improve health, wellbeing and safety**

In addition to providing participants with clinical health indicators and their personal results participants were requested to identify up to three areas that they wished to focus on in the next 12 months. Some of these individual actions included changes in diet to reduce cholesterol levels, increase fibre intake or reduce blood glucose (all risk factors for heart disease and diabetes). Actions that affected both the individual and their family included reducing stress through increased leisure such as taking a holiday or riding bikes together, changes in the family diet, improving fitness, undertaking a farm safety audit together and supplying and wearing more sun protection. These actions are illustrated below in Figure 11.4 and show the linkage between the individual, the family and the farm.

![Figure 11.4: SFF participant action planning priorities](image)

Men and women from the same farm could set different personal goals, adopt different actions and have different outcomes. Participants indicated two- three actions that usually linked with their clinical indicators, suggesting that the participants were aware of areas they needed to address. This method of participation and engagement was very popular among SFF participants with 325 participants forwarding
their action plan (96% response from the baseline year) with over 930 actions documented reflecting the enthusiasm and engagement for addressing their own priorities.

Participants also ranked their achievements on a behavioural anchored scale (the Martin scale) which linked actual behaviour and results with 0 equalling ‘did absolutely nothing’ and 5 being results ‘way above expectations’. These results (see Figure 11.5) illustrate how participants rated their own achievements. This was particularly pleasing for the project and most participants spoke and reflected on the experiences and learning over the previous 12 months. This type of reflection fits very much with the triple learning loop described by Keen (2005).

![Figure 11.5: Distribution of results for the action plan targets N= 838](image)

As Brumby et al (2008) notes these results are very much the participants’ own perceptions of how they went over the previous 12 months. However, these perceptions provide insight into people’s capacity to change their lifestyles and to exercise choices which had important consequences for their health, wellbeing and safety. This application could also be used with farm families to consider actions to address the impact of climate change with the scale providing an insight into their capacity for change. Whilst this was a simple tool it was none the less very powerful in providing an opportunity for planning, reflection and action that was reinforced by the change in health
indicators. That is, it assisted participants to move forward off the stalled ‘pause’ mode and act.

**SFF triple loop learning**

Triple loop learning was utilised as described by Keen (2005) and encouraged and supported changes in the participants assumptions and norms that they currently held and assisted participants to move forward in their thinking. If we apply Keen’s triple loop learning to the SFF program and how a participant would think about reducing an individual high cholesterol level it would look something like this.

**Problem: High cholesterol**

Loop One: learning how to reduce cholesterol through practice and action change

Loop Two: considering the underlying actions and behaviours that have contributed to high cholesterol

Loop Three: allow for changes in the assumptions and values that led to high cholesterol

In this example of high cholesterol level the single loop learning would be:

**Loop One: learning how to change practice and actions**

- Understanding high blood cholesterol level and its consequences on health
- Taking actions to reduce cholesterol e.g. physical activity, learning to read food labelling, reducing fat intake

**Loop Two: considers the current underlying actions and behaviours**

- Reflects on the actions taken to reduce cholesterol and what had worked well
- Trialling other foods (not high in saturated fat and cholesterol) that are also tasty, change the size of portions
- Consider meals that do not consist of meat and three vegetables (traditional diet)

**Loop Three: allows for changes in the assumptions and norms that led to high cholesterol**
• Questioning where norms such as 'feed the man meat' and consuming high quantities of meat came from.
• Acknowledging the role our farm heritage has in high consumption of meat. e.g. slaughtered on farm, part of award employment conditions. Meat was cheap and accessible - so began our nation of meat eaters.
• Assumptions that we needed to eat meat every day for good health

Conclusion
The SFF model has attracted interest for its positive results, high participation rate and intersectoral collaboration. Its usage of social learning to improve the health outcomes and behaviours of farm men and women and sustain the improved outcomes over time is noteworthy not only as a health intervention but as an important part of the ongoing human and social dimension of rural sustainability. For our already aging Australian farmers to be responsive to global demands and adapt to climate change, they cannot be plagued by a high incidence of largely preventable chronic illness such as diabetes, depression or cardiovascular disease. Additionally, there is the aspect of our own self interest in rural sustainability to ensure that the people who produce our food and fibre remain healthy and in business as we are reliant on their agricultural production for economic and more recently global food security.

SFF has illustrated that farmers feel they make better decisions regarding their farm when healthy and recognised the contribution that improved health makes to that decision making. This reinforces the conjecture that those people who are in good health are more resilient, can make decisions and are able to cope with the ongoing demands of climate variability. This supports the work undertaken by Hounsome et al (2006) who proposed that to enhance the uptake of agri-environmental schemes would require targeting the health and wellbeing of farmers. We could presume conversely that farmers would be unlikely to adopt agri-environmental schemes or adjust to more sustainable schemes and climate change if in poor physical or mental health.


