



Abstract / Summary

The New Zealand Beef Industry is a niche producer of a global commodity which is undifferentiated in the market place. Being grass fed beef from a huge number of different breeds, we have a product that lacks consistency and is badly affected by the production cycle of the US Beef Industry.

The future for The NZ Beef Industry should focus on Branding and Eco-Labeling, with a drive to vastly improve the consistency and eating quality of NZ Pasture Prime Beef.

Tenderness and Juiciness are the two biggest concerns that consumers have when asked to contribute feedback on what they prefer in Beef.

- Tenderness is a desirable attribute that gains its reputation from pH at slaughter and ageing post slaughter. The New Zealand Beef Industry should embrace a Post Mortem Code of Practice that incorporates pH testing, Electrical Stimulation and Ageing into a Quality Assurance Scheme.
- Marbling is the biggest contributor to Juiciness and Flavour, and grading on the degree of marbling not only means supplying a very desirable choice for the consumer, but guarantees that the lean beef devoid of marbling can be differentiated on its degree of leanness i.e. 95% Lean Beef Guaranteed.

Inconsistency in NZ Beef is a result of too many and varied breeds of cattle, with few if any quality signals going back through the many industry layers back to the breeder.

America has fallen to the advances of Pork and Poultry and I feel NZ may follow suit if we don't get proactive in making the consumer feel they *do* have a choice when buying beef and not the pot luck situation that has niggled the Industry for years.

Food Safety is a huge issue that the beef industry must come to grips with. We must enact Quality Assurance procedures from *pasture to plate* that guarantees to the consumer that NZ Beef is as safe as food can get, with an audit trail to boot.

Food Tourism is the message a successful branding strategy needs to purvey. When people see the signage they must feel adventurous and free. A story which captures the imagination will reinforce the perception that NZ beef is so natural, so healthy, and so safe to eat that a large premium for this *feeling* is totally warranted.

Table of Contents

- 1. Introduction and Background**
- 2. Objectives of this Report**
- 3. Quality Beef Defined**
 - 3.1 Quality Assurance
 - 3.2 Tenderness
 - 3.3 Juiciness and Flavour
 - 3.4 Consistency
- 4. Marbling in Beef Defined**
 - 4.1 Lean Vs Marbling
 - 4.2 Fast Food examples
 - 4.3 Grass Vs Grain Fed Beef
- 5. Beef Quality Audit**
 - 5.1 Aim of Beef Audit
 - 5.2 Method of Soliciting Information
 - 5.3 Results from Survey Forms
- 6. Marketing Opportunities with Beef**
 - 6.1 The Beef & Lamb Quality Mark Campaign
 - 6.2 The New Choice: Marbled and Lean Beef
 - 6.3 Marketing of The Worlds Best Beef
 - 6.4 Branding New Zealand Quality Beef
- 7. References**

1. Introduction and Background

The year 1973 was a turning point for the New Zealand Beef industry. Britain joined the EEC and suddenly NZ which had been a large pastoral farm for Britain for nearly a century, had to learn to sell beef into other markets. At the time our herd was based on traditional English beef cows and as the American Burger industry gained momentum NZ found itself in a great situation, and began to provide boned and boxed 90CL Lean Beef into the States.

Due to Traditional Breeds having fat grading problems at heavier weights farmers began to exploit the Continental Beef Breeds which stretched out the traditional cattle exploited Hybrid Vigor, and produced heavier leaner beef ideally suited to the US market.

As an industry we had become lazy, as it was so easy to sell undifferentiated manufacturing beef into the US at a premium price, which had the effect of diverting our attention away from prime beef production.

Our grading systems have been encouraging this type of cattle ever since with little thought about the consumers and what attributes were important for the consumers who weren't eating hamburgers. Tenderness, flavour and juiciness have only recently gained lip service within the industry. Tenderness and the pH factor profited most as farmers were made more aware of correctly handling cattle before trucking and the processors making bigger efforts to maintain quiet cattle prior to slaughter.

The message that farmers have had until now is "Big is Best!" So we have pumped up the cattle with cross breeding programmes and growth promotants with little thought of what the consumers were wanting.

2. Objectives of this Report

This project has been viewed from the angle of the consumer, with my objectives being to explore marketing opportunities for quality beef with a choice of various degrees of leanness.

The Chicken and Pork Industries have worked hard at producing consistent quality products with feed conversion efficiency beeing improved immensely along the way.

We have some very unique pastoral farming conditions in NZ and my main aim is to improve the eating quality of beef. Then explore new marketing possibilities that could be fueled by a consistent quality product and coupled with our "clean green" image under an Eco-labelling guise.

3. Quality Beef Defined

3.1 Quality Assurance

qual·i·ty (kwòl'i-tê) noun

1. An inherent or distinguishing characteristic
2. Superiority of kind.
3. Having a high degree of excellence

Quality as defined above has a range of parameters to measure up against and before these comes consistency which is the first step in the value added chain.

Quality assurance is a term that has been mooted in recent years, and could be an audit trail from the paddock to plate. In future, food safety issues will be of paramount importance to consumers when buying meat. We need to be proactive now in this area to be seen to be leading the bunch on Safe Beef.

The revamped National Beef Carcass Competition ran a trail with 130 consumers at Massey University Food Technology Department using striploins from winning carcasses in the Manawatu competition. The overriding preference of the consumers was found to be **Tenderness** and **Juiciness**.

If NZ beef became more quality focused the consistency would improve as a matter of the process. Once the product is of a consistent quality then the branding and marketing can begin.

3.2 Tenderness

“ Post Mortem treatment of carcasses has more bearing on tenderness than environment or genetic factors.” (DR R Cross 1997)

Meat tenderness is affected by the level of connective tissue, especially collagen. The other factor is the ultimate pH, which for beef is 5.8 or less and along with better keeping qualities and tenderness, beef testing to these specifications has a brighter red colour than higher pH carcasses.

Ageing is the final step in the chain to ensure tender meat. Ageing meat at 2 - 3 degrees Celsius for between 14 and 30 days will allow connective tissue breakdown and enhance the edibility of the meat.

In a study on post slaughter treatments on beef at Louisiana State University, they concluded that electrical stimulation improved the shear force test but not the sensory panel tenderness test, basically the machine thought it more tender than the humans!!

After a period of Vacuum Ageing a significant improvement in the shear force test and the sensory panel tenderness score was achieved.

The New Zealand Beef Industry should embrace a Post Mortem Code of Practice that incorporates Ultimate pH testing, Electrical Stimulation and Ageing into a Quality Assurance Scheme.

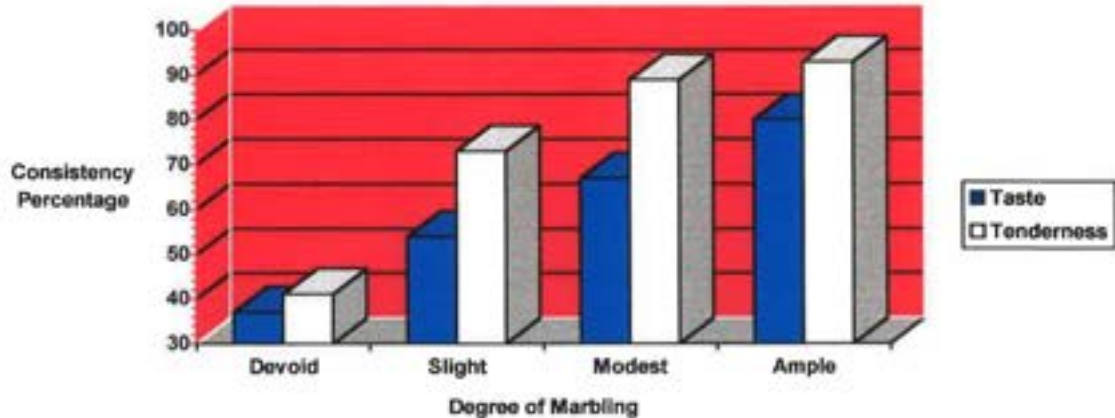
3.3 Juiciness and Flavour

“During the cooking process intramuscular fat will melt and help lubricate the muscle fibres, helping to make the meat moist and tender. Fat also stimulates the flow of saliva, keeping the meat moist as you chew - and adding to the flavour.” (Lymburn J. 1993)

Intramuscular fat or Marbling is the Taste Fat in beef and in many countries grading is a function of measuring the degree of marbling at the 12th rib. New Zealand’s Grading System does not recognise this trait.

“ The US grading system, based on maturity and marbling, fits beef into Prime, Choice, Select and Standard grades. It’s not perfect, but it’s one our customers have faith in. Customers eating prime cuts have a 1 in 16 chance of an undesirable eating experience, the ratio rises to 1 in 9 for choice, 1 in 4 for select and 1 in 2 for standard.”
(Tom Field, NZ Farmer Mar 27 1997)

Lean Vs Marbling



Graph 1

This graph shows the relationship between marbling, taste and tenderness and illustrates the plight of lean beef devoid of marbling which lacks flavour, tenderness and consistency. At the opposite extreme, ample marbling enjoys more taste, tenderness and a more consistent performance.

Both flavour and juiciness are generated due to marbling. Meat without marbling is less forgiving to cooking errors and can be dry and tasteless.

Marbling is a choice that I believe needs to be addressed in the NZ beef industry, apart from the obvious flavour and edibility enhancements that marbling allows. Grading on the degree of marbling not only means supplying a very desirable choice for the consumer, but guaranteeing that the lean beef that is devoid of marbling can be differentiated on its degree of leanness.

3.4 Consistency

Consistent quality beef is a big problem in the states even though they grade on marbling and maturity. Wayne Purcell has identified the real problem concerning consistency.

“If you want to change buying behaviour you must have a consistent top-quality product. You can’t take 80 different types and breeds of cattle and expect to supply a customer with a product which will satisfy their need for consistency, quality and convenience.”

(W. Purcell 1995)

In the Australian Feed-lot industry it’s the Traditional Cattle Breeds that are most sort after due to their propensity to lay down marbling. On grass, marbling would only be an attribute Traditional Breeds could aspire too, the Continental Breeds would produce for the Lean Beef markets. This would be a huge paradigm shift for the industry but a positive step in producing consistent quality Table beef most of the time.



The best example of consistent beef is The Five Star Beef Feedlot at Ashburton.

“At Five Star Beef we have a culture of consistency and uniformity. We only buy pure Angus steers to finish on grain for 220 days, the meat is pink with white marbling throughout. Tenderness and texture are of paramount importance and by grain feeding on a balanced feed ration we maintain consistent quality beef for the discerning and sophisticated Japanese consumer. (T. Johnson, 1997)

4. Marbling in Beef Defined

4.1 Lean Vs Marbling

MIRINZ recently researched marbling in Beef and compared lean and marbled steaks cooked to various different degrees of doneness and concluded that;

- Marbled steak had larger degrees of juiciness and was the more tender at a range of different cooking temperatures than its leaner counterpart.
- A minimum of 13% fat was needed to produce a steak which was more tender and juicy than a lean or moderately marbled steak.
- Steak that was devoid or had slight marbling was best not cooked over a medium doneness for maximum satisfaction.
- Initial Juiciness was more affected by the degree of doneness and sustained juiciness is more affected by the degree of marbling.

MirinZ also looked into the effect of marbled steak and the consumer reaction to it when purchasing beef. They concluded that high levels of marbling turned people off purchasing and a medium amount of marbling was more preferable. (MIRINZ Milestone 14 1996)

New Zealanders have never enjoyed the choice of marbled beef and thus don't appreciate the benefits yet. So higher degrees of marbling off pasture would best be branded and marketed to a niche market that is prepared to pay for Pasture Prime Marbled Beef.

In Australia consumers also prefer less marbling when purchasing beef from a supermarket, but when eating out people choose highly marbled beef.

Research on the degree of marbling and palatability in the USA is enlightening, we are ignoring it to our peril.

“One third of the time carcasses with higher marbling scores produced loin and round steaks that were more flavourful, juicy, tender and palatable than those carcasses with a lower degree of marbling” (G.C. Smith 1985)

4.1 Fast Food examples

The most significant example of the relationship of fat in Fast Foods was in 1991 when the so called *lean genius* Dale Huffman developed the McLean Burger deluxe for McDonalds which was purported to be 91% lean.

“Fast food eaters may or may not know that most of the flavour in their favourite fare comes from fat. Less fat often means less flavour.” (Sangster / Hatcher 1991)

The concoction was a brew of flavour enhancers to make up for the lack of fat and seaweed extracts to improve moisture retention.

The “Lean Beef means Business” cover story was devoted to the hype of this latest development in the fast food industry. It was a time when meat industry executives were proclaiming big spin offs for NZ due to our ability to produce large quantities of 90% Chemical Lean Beef. Euphoria gripped the industry - it was an exciting time.

A conversation with Ms Johannason the purchasing manager for McDonalds Corp. in Auckland had this to say when I queried her on the demise of the McLean Burger Deluxe.

She said,“ The Mclean Burger died, fat is flavour, it’s juiciness, it gives food a nice mouth feel. In the fast food industry we tread a tight rope where fat is concerned, too much and the various health groups come down on us, not enough and customers go elsewhere. People just wouldn’t buy the McLean Burger. Our Burgers contain 20% fat and that’s what the customers prefer”. (Ms S. Johannason, 1997)

The issue is that McDonalds had part of their branding strategy perfect and that was *guaranteeing the fat percentage* of their burgers. Now although the consumers weren’t interested in low fat burgers I believe the time is right for young (under 320kg) lean primal cuts of meat to be aged and branded with its fat percentage emblazoned on the packaging for all to see. i.e.



4.3 Grass Vs Grain fed Beef

Marbling is one of the last fat deposits to be laid down and thus becomes more apparent when the animal reaches its ultimate mature body size.

Paul Muir of Ag. Research Hawkes Bay conducted an experiment with Angus steers to ascertain the optimum carcass weight to achieve maximum marbling levels both on Pasture and Grain.

Carcass characteristics of Angus steers fed pasture & a high grain ration

		Slaughter time (weeks)			
	Group	0	6	10	14
Carcass Weight (kgs)	Pasture	316.5	341.7	353.3	363.4
	Grain		340.3	370.8	406.6
Fat Depth (12th rib)	Pasture	8.8	12.2	17.7	20.0
	Grain		9.1	16.0	19.7
Marbling Score	Pasture	3.4	3.2	3.9	4.3
	Grain		3.4	4.0	4.3

“ One widely held myth is that feedlotting is necessary to achieve high levels of marbling. However, even though pasture-fed cattle had lighter carcasses, they had similar levels of marbling.” (Paul Muir. Quality Beef, Field Day Address May 1993)

An Australian survey also concluded that there was little difference in marbling between grass and grain fed cattle at the same carcass weight provided the fat content is similar and they have been grown at similar rates.

On pasture the Traditional Breeds have the ability to lay down Marbling on a lighter mature carcass and would be the focus for Marbled Grades. While the larger Continental Breeds with heavier mature weights would be the prime target for lean beef markets.’

At present there is a major concern in the US regarding the amounts of subcutaneous fat produced then trimmed in the pursuit of marbling. Trials have been conducted to see if Expected Progeny Differences (EPDs) could be used to attain high marbling carcasses with less subcutaneous fat. The results indicated that it was possible, using existing genetic resources, to maintain marbling score and decrease fat deposits without compromising palatability.

5. Beef Quality Audit

5.1 Aim of Audit

The aim of this survey was to ask the Catering/Restaurant Industry a series of questions regarding beef quality, consistency and popularity.

It is important to know how the people selling beef feel and what improvements could be made to benefit the retailer and the consumer.

5.2 Method of soliciting information

I designed a form with 17 multichoice questions to make the survey as pleasant as possible. Signage was designed to give the audit an air of professionalism and a Freepost reply envelope was included to further twist their arm. All forms returned were done so on an anonymous basis.

5.3 Results from survey forms

I managed a 52% return rate with my questionnaire. Below are the results expressed as a percentage of the returned forms.

Ranked for quality i.e. Tenderness, juiciness, taste & consistency. Scale from 1=Excellent through to 4=Unsatisfactory

Beef	1.8
Pork	1.65
Chicken	1.6

What Specifications are used when buying Beef

Sex	70%	None Specified
Fat Grade	57%	None Specified
Ageing	20%	None Specified
	66%	14-21 Days
Breed	83%	None Specified
Price	71%	Not most important factor when buying

How many customer complaints per month

63%	No complaints
37%	1-5 complaints

Interested in Promoting & Using 95% Lean Beef 80% Yes

Interested in Promoting & Using Marbled Beef 85% Yes

I believe having talked to all of the people I sent survey forms to, that the catering/restaurant industry would love the chance to buy consistently marbled beef. As the consumer is only confronted with the cooked product, there is a win win for the restaurateur and the consumer as the eating experience would be more flavourful, juicy and more tender at a range of different degrees of doneness.

6. Marketing Opportunities for Beef

6.1 The Beef & Lamb Quality Mark Campaign

This campaign is a huge step forward in quality and promotion of beef to New Zealanders.

What's changed??

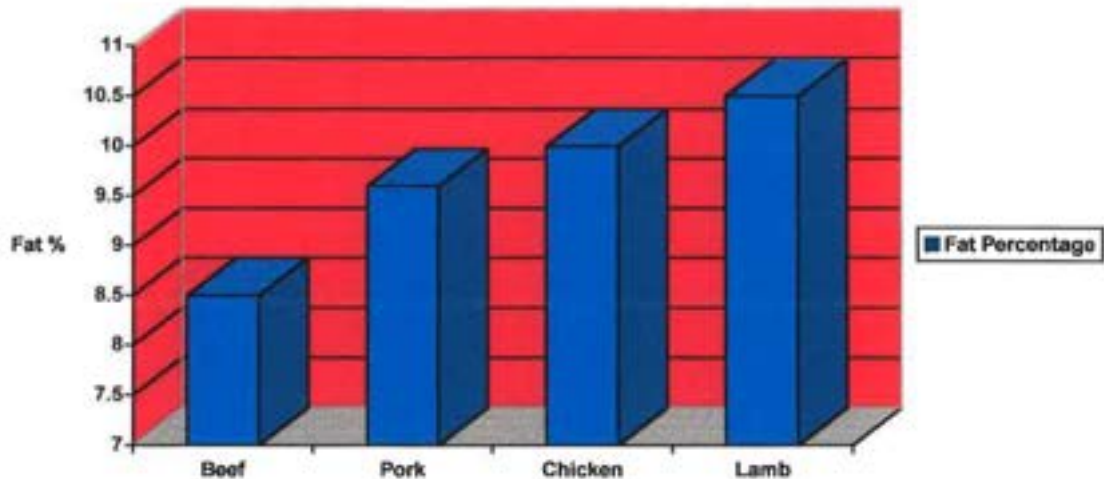
- Firstly there is excellent signage for participating retailers to use at point of sale including: stickers, posters, aprons, caps, recipe cards and a host of different ways to get the branding under the public's eye.
- Retail Ready is a new parameter which requires meat processors to stick on the boxes of beef and lamb the date at which the meat is ready for retailing. At present there is no industry minimum standard for what ageing is required and the processors determine what length of ageing they will stipulate.
- An audit trail from the farmer to the consumer, with the processor, wholesaler and retailer being audited 4 times per year. At present the only quality issue the farmer is faced with, is supplying HGP (Hormone Growth Promotant) Free Beef to the abattoir.
- Fat content of mince is the only stipulation that the quality mark guarantees, but the retailers are being encouraged to aim for around 90% Visual leanness.
- A three pronged approach is being used for promotional media.
 1. **The Quality Mark campaign** - lets the consumer know they are getting the very best of New Zealand.
 2. **Famous Meals campaign** - is promoting to the average kiwi the idea of having a go at preparing a delicious meal with 3 fun recipes.
 3. **Ingredient Meat campaign** - coined *just like mother didn't used to make* aimed at the young New Zealand woman to pick up after the iron campaign. Instead of the meat being the hero in the meal, this campaign is aiming at stimulating young women into trying new and exotic ways to enjoy beef and lamb.

This Quality Mark is certainly an exciting new dimension in promotion due to being underpinned by quality parameters and regular auditing.

6.2 The New Choice: Marbled and Lean Beef

The New Zealand Food Composition Tables shows the fat content of all meats, all cuts and all cooking practices. I feel to compare the average fat content of all the major meats would be a good place to start thinking about branding beef on its leanness.

Average Fat Content of The Major Meat Proteins



Graph 2

This graph illustrates that beef has a leaner average than our two biggest competitors and thus the ability to brand lean beef on its guaranteed fat percentage.

The excitement for the beef industry is that we could guarantee fat content % like the Dairy Board does with its Milk and that would put us one huge jump ahead of Poultry and Pork.

We have the potential as a Food Provider to give the public a much needed choice between buying Lean Beef and Marbled Beef.

Now if cattle were graded on Marbling alone they would probably mirror the US or Canadian example. They have 4 grades of marbling going from Abundant Marbling to Devoid of Marbling.

I believe 3 grades would give us the desired effect on a grass feeding regime.

1. Modest Marbling..... Marketed as Traditional Marbled Beef
2. Slight Marbling.....Marketed as Lite Beef
3. Devoid of Marbling.....Marketed 91% Lean Beef Guaranteed

The big issue to get our heads around is, if we increase Taste Fat (Marbling), we automatically increase the Waste Fat (Subcutaneous Fat). Now some breeds have the ability to lay down Marbling before having heavy subcutaneous fat, while other breeds will suit beef production in the lean to lite beef areas. So the Traditional and Continental Breeds would produce what each gene pool is best at.

6.3 Marketing The Worlds Best Beef

Andrea Mortensen, Manager of Nutrition and Education with the AMLC recently addressed the World Angus Forum on the issue of marbling and its health positioning.

The real challenge for promoting marbled beef as part of health positioning is to be able to communicate to consumers that the visual assessment of marbled beef does not equal "high fat". A CSIRO study in 1994 equated AUS-MEAT marbling scores to fat levels. A marbling score of 1 had 3.7% fat; marble score 2 had 5.3% fat; and a marble score 3 had 6.9% fat.(A. Mortensen, 1997)

The possibilities for NZ Beef are huge, but only once we have ironed out our production and grading systems to give the industry a consistent quality product to market. The status quo at present is certainly not worth branding as anything unique.

Industry Best Practice Parameters need to be developed to ensure that we as a tiny exporter of just 6% of the worlds beef is united in quality and consistency.

Dr Andrew Stoeckel, executive director of the Centre of International Economics delivered a strong message to the World Angus Forum in Australia last month.

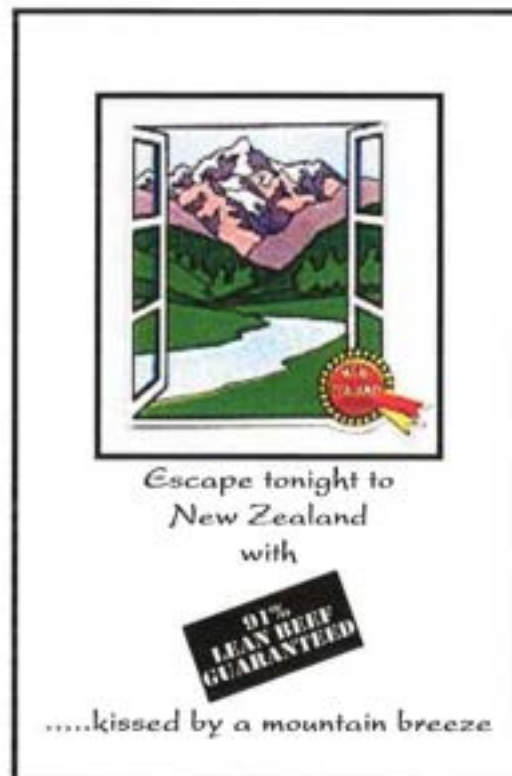
The key message for producers is simple: beef can do little to compete with chicken on price alone. It must rely on quality and consistency to retain and build its market share. Guaranteeing eating quality is an important step in a brand becoming established and widely accepted in the beef industry. (DR A. Stoeckel 1997)

6.4 Branding New Zealand Quality Beef

Brand building is about finding a point of difference - something unique. Brands are about a world of design, story telling, product positioning, values, intellectual know-how and a strong sense of place. Most of our products in their base form are ranked the worlds best, but we fail to celebrate them carefully in strong brand stories unique to us. (B. Richards 1997)

There are many examples of branding very ordinary products with 'sexy' labelling to personify to the consumer a perception of what the product will do for them. The reinforcing of the consumers perception once a branding strategy is enacted upon is critical.

The big future for NZ Beef is to offer the city dwellers of huge metropolises abroad, a chance to escape to sense freedom from the smog, hustle and bustle of the city.



Food Tourism is the message a successful branding strategy needs to purvey. When people see the signage they must feel adventurous and free. A story which captures the imagination will reinforce the perception that NZ beef is so natural, so healthy, and so safe to eat that a large premium for this *feeling* is totally warranted

Strong imagery of rivers, rolling green hills and snowy mountains is where NZ excels and this needs to be romanced and conveyed on labels, point of sale promotional material, magazine and TV advertising.

We need a rugged individual called Jock who epitomized a high country farmer clad in oilskins and a felt hat astride a fine chestnut mare mustering a herd of prime Angus steers over green pastures with white snow capped mountains leaping into the sky in the distance.

There is no beefmore Natural
....more Healthy
....more Romantic.....than New Zealand Beef

....kissed by a Mountain Breeze

7. References

- Dr R Cross, Tender Meat is Missing. NZ Farmer, June 5 1997 pg 26
- Field T. (1997) Commodity trading a hurdle. NZ Farmer (Mar 27 1997) pg 15
- Lymburn J. (1993) Meat Producer p.g.19 third quarter
- Meadows G. (1996) The NZ Guide to cattle breeds pg 26-27
- Meat and Poultry Magazine Feb 1996
- Muir P. (1993) Effects of Nutrition on Beef Quality. Beef Council Quality Beef field day proceedings May 1993 pg 35-37
- Per Capita Beef and Veal Consumption (10/10/97) FAS Online
Internet <http://www.fas.usda.gov/dlp/circular/97-03/beefpcap.htm>
- Purcell W. (1995) The Brand of Success. The NZ Meat Producer Vol.24, Num.1 pg24
- Quality Mark Campaign Retailers Guide (1997)
- Richards B. Branding adds vital magic feel. NZ Farmer, Jan 23 1997 pg 11
- Sangster / Hatcher Cover Story. Meat Producer, 3rd Quarter 1991 pg 4
- Scott S.M., Cummings T.L. & Devine C.E. (1996) Retail Attributes - Meat Marbling and its Influence on Eating Quality. Project 92MZ 5/6.2 (MZ/RET) Milestone 14. MIRINZ.
- Selk G. (1996) Use of EPD's for Marbling in Beef. July/Aug ANSI Facts-Research Update. Internet <http://www.ansi.okstate.edu/exten/nl960708/mayresup.htm>
- Smith G. (1995) A Tough Assignment. The NZ Meat Producer Vol.24,Num1 pg 23
- Smith G.C. (1984) Relationship of USDA Marbling Groups to Palatability of Cooked Beef. Journal of Food Quality 7 (1984) pg 289-308
- Dr A. Stoeckel, World demand for beef grows. NZ Farmer 13 Nov 1997 pg 32
- The New Zealand Food Composition Tables pg46-54
- Trevor Johnson, Five Star Beef Intro. letter and phone call. 12 March 1997