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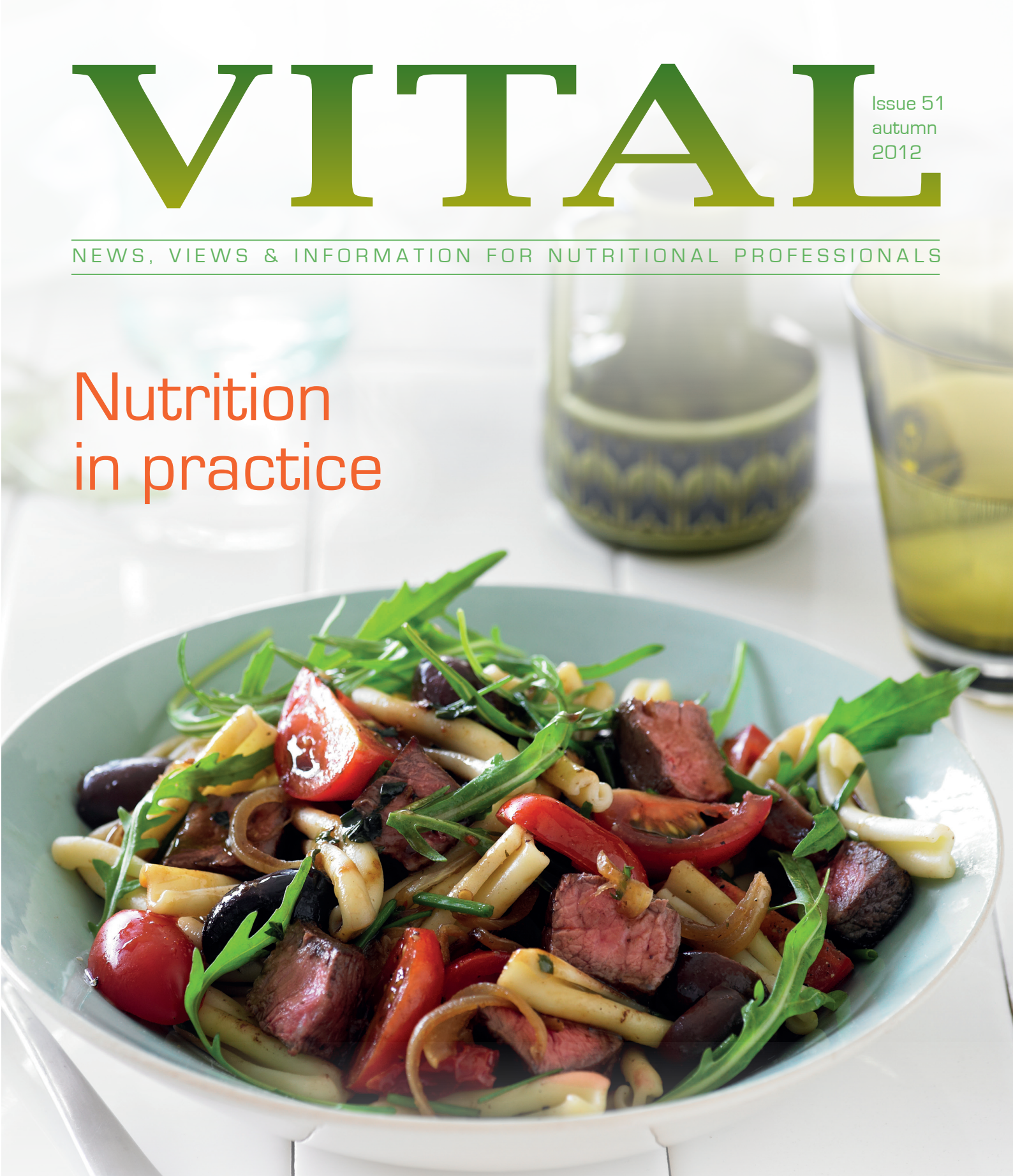
NEWS, VIEWS & INFORMATION FOR NUTRITIONAL PROFESSIONALS

Nutrition in practice



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MEAT & LIVESTOCK AUSTRALIA

EDITORIAL

There are many aspects to nutrition and in this issue of *Vital* we explore several areas relevant to dietetic practice.

Whilst macronutrients have been the main focus of diabetes management, emerging research suggests that micronutrients may also be relevant.

When it comes to weight management, best practice involves diet, physical activity and behaviour modification. Understanding the lifestyle and mindset of the target audience helps to ensure the advice is relevant and more likely to be implemented. Enclosed with this issue of *Vital* is a new brochure from MLA, designed specifically for young women, on weight loss, that combines evidence from scientific as well as consumer research.

Because the availability of healthy options is critical for healthy eating, we report on a retail survey of beef mince which shows that lower fat mince is widely available for purchase in Australia.

Taste is one of the biggest drivers of food choice. Whilst not based on the nutritional content of meat, we report on Meat Standards Australia (MSA), an eating quality program for beef which highlights how all factors along the beef supply chain contributes to the eating experience.

As always, we encourage your feedback and ideas for future issues.

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Diabetes:

investigating the zinc link

Associate Professor Samir Samman and Ms Elizabeth Stathakis, from the University of Sydney, recently reviewed the evidence on zinc and type 2 diabetes. *Vital* reports on their findings and the implications for dietary advice.

Emerging evidence suggests that low zinc status may increase the risk of type 2 diabetes (T2DM). An inverse association has also been reported between zinc status and metabolic syndrome. Professor Samir Samman and Ms Elizabeth Stathakis conducted a systematic review to gain a better understanding of the available evidence on zinc and T2DM.

Zinc deficiency and type 2 diabetes

The systematic review, comprising 5,588 adults with T2DM from 28 cross-sectional studies in 18 countries, found that zinc status was negatively associated with blood levels of insulin and glucose in people with T2DM.

The majority of studies reviewed, including those of higher quality rating, reported reduced zinc concentration in blood or hair of adults with T2DM. Five studies measured urinary zinc excretion, which showed an increase in zinc excretion compared to controls (figure 1). Subjects at increased risk of zinc deficiency had a higher HbA1c.

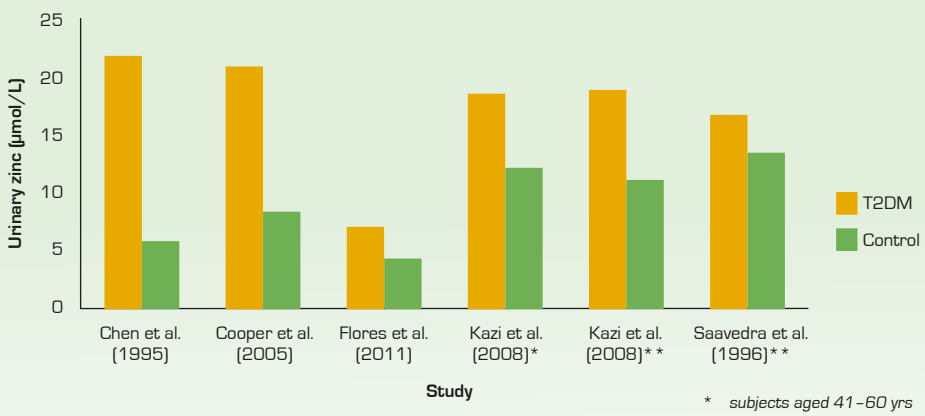
"Our findings are consistent with evidence suggesting disturbances in zinc regulation in the pathogenesis of T2DM," says Ms Stathakis. Zinc is necessary for the synthesis of insulin in β-cells. It is co-secreted with insulin and participates in the regulation of glucose metabolism. Improvements in glycaemic control in people with T2DM have been reported when zinc stores are replenished. Several mechanisms have been proposed to explain the role of zinc on insulin metabolism.

How does zinc affect insulin metabolism?

Zinc deficiency could affect insulin and glucose metabolism in the following ways:

1. Redistribution of cellular zinc may impair insulin secretion. Zinc regulation depends on two families of transporters: ZIP, which regulates the influx; and ZnT, which regulates the efflux of cellular zinc. One of these transporters, ZnT8, is primarily expressed in β-cells and its expression strongly modulates insulin secretion.
2. People with T2DM have increased levels of oxidative stress. It may be that the antioxidant properties of zinc help protect insulin from oxidative stress.
3. Zinc's role in immune function may help prevent immunological disturbances which could impair glucose metabolism.

Figure 1: Mean urinary zinc excretion of T2DM and control subjects



Possible causes of zinc deficiency in type 2 diabetes

Professor Samman suggests the following reasons why people with T2DM may be at increased risk of zinc deficiency:

1. **Diet**

   Lower dietary zinc intakes were more prevalent in people with T2DM than in controls, although this was not consistently reported in all studies. This may be due to limitations in measuring dietary intake and zinc status. According to Professor Samman, total dietary zinc intake is not a good indicator of zinc adequacy. Instead, the ratio of dietary zinc to phytate should be considered as phytate is known to adversely affect zinc status. Unfortunately, data on the phytate content of foods is limited, making zinc intake difficult to assess.

2. **Increased physiological requirements**

   Requirements may be increased as a result of having T2DM. Increased oxidative stress is common in this condition and may require higher levels of anti-oxidants, including zinc. Hyperzincuria was prevalent in those with T2DM, suggesting increased losses.

3. **Genetic predisposition**

   Zinc plays an important role in β-cell function and insulin homeostasis. A recent meta-analysis of 14 cohort studies found that total zinc intake was inversely associated with plasma glucose and that the effect was stronger in individuals with a glucose-raising genotype which affects ZnT8 expression[1]. Others have also reported an association between disturbances in ZnT8 function and increased risk of T2DM.

Reference

1. Kanoni S, Nettleton JA, Hivert MF et. al. Total zinc intake may modify the glucose-raising effect of a zinc transporter (SLC30A8) variant: a 14-cohort meta-analysis. *Diabetes*. 2011 Sep;60(9):2407–16.

Implications for dietetic practice

As yet it is unclear whether people with T2DM are at risk of zinc deficiency as a result of poor diet, increased requirements, or due to genetic susceptibility. Nor is it possible to determine whether zinc is important for preventing the development of T2DM or whether it is more relevant in managing the condition and its complications.

However, with T2DM now occurring among young people and an increasing prevalence of T2DM in adults, it is important to understand the influence micronutrients such as zinc play in the development of T2DM.

Current dietary advice focuses on foods chosen to influence the macronutrient profile. This study suggests zinc requirements should also be considered. Professor Samman recommends considering the total diet and lifestyle in managing people with T2DM. "It is important to recommend a diet low in saturated fat and with a lower glycaemic load. In addition, it is also worth checking dietary zinc intake. The diet needs to contain good sources of bioavailable zinc such as red meat, dairy products and seafood." For vegetarian diets, ensure the ratio of dietary zinc:phytate is less than 15 by avoiding excessive intake of high phytate foods such as wholegrains, nuts and legumes.

The search for a good biomarker of zinc status

Measurement of zinc status is complicated by the small amount of zinc in the blood and the wide range of storage sites in the body. Plasma zinc, the most commonly used diagnostic indicator, accumulates in only 1% of the body pool of zinc. Furthermore, symptoms of marginal zinc deficiency are difficult to assess. Consequently, current laboratory measures may underestimate the true prevalence of zinc deficiency.

Professor Samman is conducting research to determine whether zinc transporters offer a more reliable measurement of zinc status. This research will not only help to inform dietary advice for ensuring zinc adequacy, it will also help to inform advice for the prevention and management of chronic diseases.

‘Look good, feel good: a weight loss plan for young women’

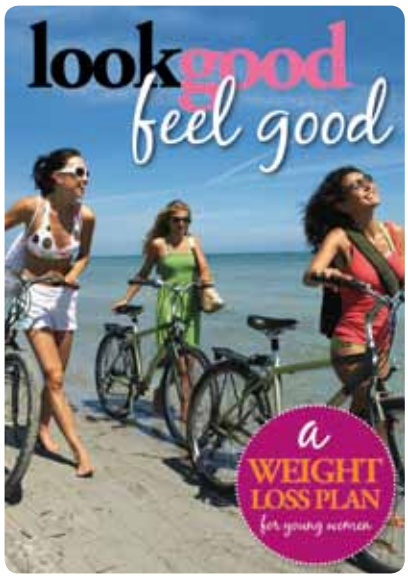
A new brochure by Meat and Livestock Australia, combines evidence from scientific and consumer research into an empathetic and pragmatic approach to weight loss for young women.

Previously, *Vital* (#49) reported on the increasing rate of weight gain in young women in Australia and the need for evidence on effective weight management strategies tailored to the needs of this vulnerable population group. Dr Helen O’Connor and her research team at The University of Sydney were the first to demonstrate the effectiveness of a higher protein diet for weight loss in young women aged 18–25.

The dietary advice in Meat and Livestock Australia’s ‘Look good, feel good’ brochure was informed by the University of Sydney study, and in consultation with researchers and dietitians working with young women.

The eating plan detailed in the brochure is based on a nutrient-rich, higher-protein diet. This was shown to be effective for weight loss in young women. The young women in the University of Sydney study tended to report feeling less hungry and having less desire to eat, which may have made the diet easier to follow. The eating plan encourages consumption of nutrient-rich foods, as research shows when energy intake is restricted, it is difficult to meet iron requirements.[1] This is particularly important during weight loss, as feeling tired, which is a common symptom of low iron levels, can make being physically active and implementing positive behaviour changes difficult.

O’Connor’s study and consumer research highlighted the need for guidance and support, tailored to the lifestyle of young women. Young women are in a challenging time of transition from school to work, and from adolescence to adulthood. They eat out often, tend not to be confident cooks and use alcohol as a vital part of their social life.



Consumer insights

In developing the brochure, MLA commissioned consumer research on ways to effectively communicate weight loss advice to young women. These are some of the insights gathered in the research about young women, their attitudes to weight loss as well as their feedback about the brochure.

- The key driver to lose weight in this group is confidence. It’s about looking good, feeling good, social pressure and relationships. Health is a secondary concern. A number of titles for the brochure were tested and ‘look good, feel good’ registered as most appealing and motivating to young women.
- Alcohol is central to socialising for young women, and any recommendations to not drink are consequently seen by young women as unrealistic. The brochure provides guidance on moderating alcohol intake in a pragmatic and non-judgemental fashion, which is appealing to young women.
- ‘Diets’ are considered tough and restrictive by young women. They favour the guidance of the ‘daily food plan’ with tips on what they could eat, inclusion of ‘free foods’ and the ‘weekly treat allowance’, rather than lists of what they can’t eat.
- They also liked tailored advice on how to adapt healthy eating to their busy lifestyles. Many young women are still living at home, where mum cooks. They appreciated tips on managing out-of-home eating occasions, where they may have more control over their choices than they do at home. The eating plan is designed to suit different styles of eating; ‘at home’, ‘on the go’ and ‘out & about’.
- The research highlighted two types of audience in the target group: ‘investigators’ and ‘skimmers’. The brochure was written and designed to communicate effectively with both groups.

Since young women tend to seek weight loss advice in magazines, the brochure will be disseminated through popular magazines and websites targeting young women, including *Cosmopolitan*.

Reference

1. O’Connor H, Munas Z, Griffin H, Rooney K, Cheng H.L, Steinbeck K. Nutritional adequacy of energy restricted diets for young obese women. *Asia Pac J Clin Nutr*. 2011;20 (2):206–211.

Beef mince:

lower fat is a popular option

A retail survey reveals that lower fat mince is the most widely available mince available for purchase in Australia.

Beef mince is a popular choice for Australian shoppers. It is a variable product, which is prepared by retailers according to their own specifications, and to suit the demands of their customers. To find out about the mince available for purchase, a retail survey was conducted by Meat & Livestock Australia in 2010.

The nutrient composition of two types of beef mince is provided in NUTTAB 2010 – lean/low fat and regular mince. The main difference between these different types of beef mince is in their total fat content where lean has 7g/100g and regular, 12.9g/100g

Typically, nutrient composition data is based on a homogenate of 10 randomly selected samples and consequently, any variability between individual samples cannot be determined. In this survey, the fat content of each individual mince sample was analysed in order to determine the extent of variability between beef mince both across and within the different types of mince available for purchase.

SURVEY DESIGN

Sixty-one random samples were selected from 24 of the major retail outlets in NSW, Queensland, Victoria and Western Australian in 2010. Retail outlets, including supermarkets and butchers were selected to reflect differences between the major retail outlets which may impact on the type of mince available for purchase. Retailers were located in low and high socio-economic areas.

The fat content of each sample was analysed and categorised according to the following three categories based on their fat content (% total fat):

- Lower fat category which included samples with less than 5% total fat
- Medium fat category with samples containing 5 to 10% total fat
- Higher fat category with fat content greater than 10% total fat

The weighted mean fat content was calculated using all 61 samples of raw beef mince samples for each fat category (low, medium and high). The weighting for each mince sample was based on the market share of each major retailer outlet within each state (NSW, VIC, Qld and WA).

The lower fat mince contained an average of 4.1g fat per 100g, the medium fat mince contained 8.9g fat per 100g and the higher fat mince contained 10.4g per 100g (Table 1).

Table 1: Average fat content of beef mince available for purchase in Australia

Type of mince	Average fat content (g/100g)
Lower fat mince	4.1g
Medium fat mince	8.9g
Higher fat mince	10.4g

Choice of mince available for purchase

The majority of retailers (n=14) sold three different types of mince: a lower fat, medium fat and higher fat option. The remaining 10 retailers sold two options, typically a lower fat option and either a higher or medium fat option. All but one of the 24 retailers surveyed offered a lower fat mince.

Lower fat mince most common

The survey found that lower fat mince is the most widely available type of mince available for purchase:

- Of the total samples analysed, 70% contained 10g of fat or less per 100g raw mince.
- Lower fat beef mince (< 5g total fat per 100g raw mince) was available for purchase in all but one of the retail outlets.
- Differences in the type of mince available for purchase in low compared to high socio-economic suburbs were not statistically significant (see Table 2).

Table 2. Availability of lower, medium and high fat retail beef mince in major retail outlets in Australia and by socio-economic status

Fat Content Category (% total fat)	Total	Low SES (%)	High SES (%)
Lower (< 5%)	39% (n=24)	34.4% (n=11)	44.8% (n=13)
Medium (5–10%)	31% (n=19)	31.3% (n=10)	31.0% (n=9)
High (> 10%)	30% (n=18)	34.4% (n=11)	24.1% (n=7)

Chi-square, P > 0.05

Meat Standards Australia:

great tasting beef every time

The MSA grading system takes the guesswork out of buying and preparing tasty, juicy, tender beef.

What is MSA?

Meat Standards Australia (MSA) is a system of grading beef according to its eating quality. Extensive research has gone into its development so that consumers can be assured that a cut of beef that meets the MSA standard will meet their expectations for tenderness, juiciness and flavour when prepared by the recommended cooking method. Many consumers are confused about which cuts to buy and the right cooking methods to use. MSA is designed to help them take the guesswork out of buying and cooking beef.

How was MSA developed?

Consumer taste test panels were used to identify the key factors that contribute to consistent quality beef. More than 86,000 consumers across eight countries rated the tenderness, juiciness, flavour and overall liking for the full range of beef produced in Australia. The research identified key factors associated with the production of meat from the paddock to the plate that impacts eating quality. Key factors include the age, breed, sex, growth history, processing and storage techniques and cooking method.

Analysis of this data generated criteria that make it possible to accurately predict the eating quality of individual cuts. Importantly, no single factor is all-important. The research indicates that all steps in the production process have some impact on the final eating quality, including the cooking method.

Who can use the MSA logo?

MSA is a voluntary program. Abattoirs, wholesalers, retailers and food service outlets can apply for a license to use the logo. The license conditions demand the incorporation of MSA requirements into existing quality assurance programs. Compliance is audited.

MSA standards must be maintained from paddock to plate. Cattle that meet MSA requirements are graded at MSA licensed abattoirs. MSA accredited graders assess information from the producer and processor (including carcase weight; sex; breed; hanging method; HGP use; ossification; marbling; rib fat; pH and temperature; meat colour), to produce a grade which estimates the interactive effect of all factors on eating quality. A grade is specific to each cut of beef and a number of recommended cooking methods. Only cuts that meet all MSA specifications can be packed and sold as MSA 'graded'.

Where can consumers find MSA beef?

The MSA symbol is increasingly being used on graded beef in supermarkets and at butchers around the country. To date more than 600 butchers and several supermarkets are participating in MSA. Consumers will see the MSA logo on individual beef cuts that have been cut in accordance to the recommended cooking method for that cut, so a cut of beef ideal for grilling is cut as a steak.

Consumers can get more information about matching the right cut to the right cooking method by visiting **www.themainmeal.com.au** or by downloading the Beef Essentials app, free from the iTunes store. The app provides cut-to-cook matches, as well as step-by-step instructions on how to cook using the recommended methods. Using the app makes it simple to shop for and cook a juicy stir fry, perfect steak, succulent casserole or tasty roast. Starting each meal with MSA graded beef ensures a quality result every time.

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