final report

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Finalisation of Restructuring Work

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Abstract

The potential for frozen bovine plasma lies with the processed meat industry. Limited production and the importance of training the industry how to take advantage of plasma technology dictates this strategy. Of greatest potential is the fact that South Burnett can divert horizontally and produce plasma restructured meat of defined CL tailored for selected customers. This will establish a new concept in meat wholesaling which will allow abattoirs collecting plasma to control the material and get better returns. At the same time lobbying must be initiated with the NFA to alter the offal status of blood plasma to bovine plasma protein.

Executive Summary

The strategy chose by the MRC to pursue the development of liquid bovine plasma rather that sprayed dried plasma has proved to be correct and the foray into commercialisation of plasma usage by the food industry and the willingness of the South Burnett abattoir to establish a plasma collection plant, has clearly demonstrated the potential plasma offers.

The major application for liquid for frozen plasma is at present in the processed meat industry. One company Blackforest Smallgoods in Marrickville NSW, has adopted the incorporation of frozen plasma into meat massaging operations for hams and corned beef production. Results indicate the plasma improves yield and succulence and performs better than the American sprayed material. This company will be using approximately 50 litres plasma per day to a maximum of about 200 litres plasma per week. The company is also considering using plasma as an emulsification aid in high quality frankfurts.

At present, because of the limited commercial quantities from South Burnett abattoir and because the processed meat industry is unlikely to entertain a cost of plasma more than the price of say 75 CL beef trim, it will be essential to woo the processed meat industry by developing a strategy of demonstrating the potential of plasma to individual processors, as was done in this program with Kudos Meats, Queensland and Blackforest Smallgoods, Sydney. The technology for meat restructuring was easily applicable at Kudos Meats where products such as restructured no added salt roast beef forms an extension of a profitable market mix. The use of plasma in the manufacturing of emulsion meat products is now a proven advantage in that the product quality appears to be superior when compared to emulsion meat sausage made from farinaceous emulsification systems. The use of plasma as an adjunct to produce a fat emulsion which can then be added back to produce sausage with less than 20% fat is simple, and timely to meet market demands.

The attempt to interest the meat pie industry with the potential to save production costs and to streamline the pie making process was not successful. Herbert Adam's, exhibited interest in trialing the plasma concept before their take over, but now have a policy where no blood products are allowed in their products. Similarly the Sargents pie makers in NSW were reluctant to risk listing blood plasma as a food ingredient. Unfortunately the pie makers are concerned about the use of plasma and the labelling implications which might follow. Clearly the food industry is sensitive about the word blood plasma. The National Food Authority (NFA) currently places blood plasma in the offal category and the label listing would have to blood plasma. This does not mean that the labelling cannot be altered. Appended to this report is the appropriate legislation and the requirements to alter the status of a food ingredient. It was strongly recommended to me that those interested present themselves to the Scientific Director Dr Gordon Burch at the National Food Authority 55 Blackall Street Barton ACT, phone 06 271 2215, for advice as to how to prepare the appropriate documentation for altering the label status of bovine blood plasma. This disappointment with the pie makers has offered the opportunity for a plasma producing organisation such as South Burnett to consider horizontal expansion into the meat processing. The concept of producing plasma restructured defined meat blends which take the advantage of cheaper meat portions and which are suitable for the further processing into say emulsion meats, is now open to a strategy development. This is a new concept in meat wholesaling.

The potential to further investigate the antioxidant factor observed in fresh plasma and not in dried plasma, may in the future, offer the food industry benefits and be of greater economic advantage to the abattoir. Also the fractionation of plasma into fractions suitable for the vaccine industry is an attractive market offering big returns. Both these potential's will require further laboratory and pilot development work. The potential to work with CSL who have the plasma fractionation technology exists, and initial interest in utilising cheaper plasma for tissue culture has been expressed by a major vaccine producer in Australia.

Dr Peter Cranston
April 1996

Commercial Potential for Bovine Plasma

Background

Previous work has shown that bovine plasma in the fresh or frozen form will produce an acceptable restructured meat product and when combined with the food phosphate, potassium polymeta phosphate results in a stable an effective emulsification system; MRC Report UNSW 007. Following interest from the Hoechst chemical company and a workshop run at the University of Western Sydney Hawkesbury in May 1995 and the interest shown by the South Burnett abattoir in Queensland this project was undertaken to evaluate the commercial benefits of bovine plasma. The main objective was to find commercial interest and develop a marketing strategy for bovine plasma producers.

Business & Marketing Strategy

Mission

To introduce bovine plasma as a meat processing aid to the processed meat industry from abattoirs willing to set up for blood plasma collection and distribution.

Suggested strategy

There is no doubt that for the industry to adopt the technology there has to be some leadership from the organisation whishing to process the plasma. The first part of the strategy is for the organisation, in this case South Burnett abattoir, to become acquainted with the restructuring technology. In part this has been achieved in that Mark Stokes of South Burnett participated with the trials at Kudos Meats in April of this year. It also became clear from the factory trials that meat processors expected miracles from plasma. They associate the material with protein extenders such as soy proteins. Clearly this is a problem of education, and the meat processors have to alter their attitude towards processed meat products as being price rather than being quality driven. This is a big ask in the present meat processing climate but in fact may be the necessary catalyst for the introduction of plasma. The work carried out at Blackforest Smallgoods indicated plasma as a massaging aid for the production of high quality hams with good succulence and adhesion has ensured a quality product for a quality niche market, the international hotels. This market is not too concerned at present by the fact that beef protein and ham protein is mixed. Other industries are more concerned with the labelling aspects of the technology, and MRC will have to develop the logistics to work with the National Food Authority and alter the categorisation of plasma from offal to bovine protein plasma.

I. The recommended strategy is therefore for MRC and South Burnett to work together and lobby the NFA for plasma categorisation more applicable to marketing needs.
II. Because of the limited supply of plasma, it seem practical for South Burnett to cultivate a few small users of plasma such as Kudos Meats and Blackforest Smallgoods, but at the same time consider horizontal expansion into either the smallgoods business or the supply of an intermediate meat product which utilises the plasma restructuring technology. As South Burnett is currently setting up a meat processing centre, this approach seems practical.
III. The development of more highly priced fractions from plasma will depend much on the extent to which the plasma collection and processing grows. There is no doubt that fractions from plasma will bring higher prices and returns from the vaccine industry and possibly the food industry if it can be proved that these fractions can be produced and meet the

technology goals. Therein lies the risk, and the establishment of research and development will depend on the growth of the plasma market.

Problems for the plasma producer to overcome

For plasma to have any chance as a processing aid in the manufactured meat industry, it must not be sold for more than the current price of say 75 CL (chemical lean) trim, about $1.50 per Kg. The meat processor at present equates plasma as a protein extender, which it is not, and while the process meat industry is price driven and concerned only with high yields and extension of protein with cheaper vegetable protein, plasma will not be able to compete. On this basis an organisation producing about 1500 Kg plasma per week can only expect a revenue of about $2250 per week.

The limited production level means that South Burnett will have to select its customers on the basis of their commitment to producing high quality meat products and ensure they understand the difference between quality and protein extension.

On this basis it seem more practical to consider the conversion of the plasma at the abattoir level into another form of meat. The restructuring technology is now available and with simple blending calculations, (an example is presented in this report) the abattoir could supply the processed meat industry with accurately protein controlled meat blends. These blends should in fact be cheaper than higher grade trim and because of the restructuring process will be suitable for further processing into smallgoods by a meat processor. Meat such as shin meat could be easily blended and converted into a higher value commodity. Using the plasma at the 10% level and based on the amount of plasma currently available this equates to 15 tonnes of blended meat which could sell for say $1.10 per Kg and be equivalent to 80 CL meat, giving a total revenue of $16,500. (These are estimates based on quoted prices from the market). Simply, it appears that the commercial strategy for South Burnett would be to utilise the plasma in house to develop frozen restructured meat for the processed meat industry to use as the raw material of choice. The exact blend of meat would depend on the client's specific fat to lean requirement.

From a marketing aspect there is no doubt that South Burnett would have to convince some selected customers of the benefit of this strategy. But since the technology is simple requiring no special equipment and since South Burnett has the freezing capacity, distribution capability and technically trained staff and an area being set up for meat processing, little capital expense is required.

Summary of commercial economics

If bovine plasma is to be collected and sold to individual meat processors it will only be accepted if the cost to the processor in not more than the current cost of say 75 CL trim. The return to the plasma producer is minimal.

On the other hand if the plasma producer were to adopt the restructuring technology and offer the meat processor a meat blend which could be easily introduced into meat product formulations, the return is significantly improved by a factor of 7.

Plasma as a massaging improver.

The most successful area within the food industry where bovine plasma has immediate application is in the value adding of meat to smallgoods production. Efforts so far to induce

processors to try and use plasma has met with success at Black Forrest Smallgoods, Marrickville NSW, and continuation of commercial trialing at Kudos Meats in Queensland.

Initially, addition of plasma to ham pumping pickle solutions was carried out with bovine plasma produced from both Brisbane abattoir and South Burnett abattoir in Queensland. Although this technique proved reasonably successful, the binding quality of the plasma proved to be more beneficial by direct addition of the plasma to the massaging process. Hence for ham processing the hams are first pumped to a suitable level, such as a plus 20% and then placed in the massager where an extra portion of pickle and plasma is added to give a final pump level of plus 25%-30% and a plasma level in the pumped meat of 2 kg plasma to 20 Kg pickle.

This method of plasma addition to the massaging process is simple. Frozen plasma is simply added to the massager and the meat there in. The mechanical action of the massaging eventually liquefies the frozen plasma and the massaging action absorbs the liquid into the meat muscle tissue.

Trials using approximately 800 Kg meat clearly indicated the final hams had a better texture and bind hence succulence than similar batches made with powdered plasma obtained from the American Protein Corporation used at a level of 1.5 kg plasma powder to 20 L pickle.
It was observed that the yield using the liquid plasma was about 2% better than the yields from powdered plasma. It must be pointed out that powdered plasma also increases yield when added to pumping pickle. Also the powdered plasma tended to lump and not distribute evenly in the massaging process. Essentially better than 115%-120% yields can be expected from the addition of frozen plasma to meat massaging operations.

It must be emphasised that yield is not the main criteria for promotion of plasma use as a meat massaging aid however it does aid weight gain. Many other factors are important in massaging meat. Low temperature control is as important as the quality of the meat and the type of massager used . A vacuum massager was used in this project and the cycle of vacuum, massaging and rest are generally considered as proprietary technology by meat processors.

Plasma and emulsified meat products.
Addition of plasma to meat batter mixtures has proved to produce smoother meat batters for such products as frankfurts and luncheon sausage. The important fact to recognise is that it is the functionality of the plasma which is important and not the protein content. It is an unfortunate fact that Australian meat processors are preoccupied with the protein levels in food additives used in meat processing and not cognisant of the functional aspects of the additive. With plasma, the emulsification enhancement character produces a smoother and adhesive meat matrix. Plasma is a meat derivative and not a vegetable or milk based functional ingredient. It does not have the protein levels found in soy and other vegetable based concentrates and isolates it, but it allows for the production of high quality emulsified meat products. In future marketing programs this positive characteristic of plasma has to be promoted. It is not possible for plasma to compete with the vegetable and milk proteins in terms of protein fortification.

Because of the limited production and availability of plasma its use in emulsified meat products will be limited to the top-of-the-range products which draw premium prices. Excellent emulsified meat sausages have been prepared by using a frankfurt recipe as follows.

Basic Frankfurt Recipe

Beef trim 80/20	58.6	%
Pork trim 50/50	16.6	
Beef heart	8.0	
Ice water	11.5	
Plasma liquid	2.0	
Potassium poly meta phosphate	0.5	
Salt	2.0	
Sugar	0.3	
Sodium erythorbate	0.08	
Sodium nitrite	0.02	
Ground mustard seed	0.2	
White pepper ground	0.2	

In this formulation the plasma replaces some of the water and the protein content of the plasma which is only about 10% is considered as part of the protein content. This recipe results in a succulent and smooth batter with approximately 20% fat and no starches. Clearly a high quality recipe which by appropriate cooking and smoking will produce an up-market product. Undoubtedly readers of this report will think they have better formulations for an emulsified sausage product , but the purpose of the work was to demonstrate, in a commercial facility, the practicality and potential for plasma incorporation. The results clearly indicate the potential of the plasma as an aid for meat emulsification. As flavour did not suffer at the plasma level used it is more than probable that higher level could be used.

Fermented meat products.

There appears to be no technical information relating plasma incorporation into fermented sausage formulations. The reason is probably due to the fact that as the sausage meat acidifies during the fermentation process it shrinks, and about 30% of it weight is expressed as water, and lost. The rationale adopted by most sausage makers would be: why add an ingredient which will only add more moisture to the formulation and possibly lengthen the fermentation process.

The addition of plasma at up to 5% of the formulation does not in fact lengthen the fermentation process. Being a meat derivative and an ideal medium for the growth of bacteria as well as having some inherent antioxidant activity, plasma seems to increase the rate of pH drop and the final weight loss is reduced by about 5%. Hence instead of losing say 30% weight the salami will only lose about 25% and still have a final pH of <5 and a water activity of <0.92. The production procedure is simply to add the plasma to the cutter as the meat is being reduced to its desired size. At the level of 2.5% the plasma is quickly absorbed by the meat mass and does not make a sloppy bulk difficult to fill into casing. Considering salami is sold on a per Kg basis the reduction of weight loss with no alteration to those parameters which contribute to quality it would seem to be a boon for the fermented sausage maker.

This project did not allow for the detailed study of the effect of plasma on the rate of pH drop during fermentation, which is currently an important public health parameter for fermented sausages. The trial work carried out for this program only resulted in qualitative observations. The fact that little technological information exists on this aspect of bovine plasma application indicates that some research into this aspect of technology should be considered.

Plasma and meat colour stability.

During the preparation of restructured meat in combination with bovine plasma, it was noticed that fresh beef tended to maintain its pink colour during refrigerated storage. As this work was experimental it was decided to carry out an pilot trial at Chisholm Manufacturing late in 1995. The aim being to see whether the observations made in the laboratory could be reproduced in a commercial pilot plant. They were. Quantitative colour measurements were not measured. However effect of plasma on maintaining the pink oxymyoglobin colour was readily apparent. Now that plasma is going to be made available from South Burnett the opportunity to repeat the work and measure the colour stability using objective and quantitative methods is practical. Since the trials were carried out communications with other researchers point to the possibility that thioredoxin may be the agent in the plasma which contributes to the antioxidant effect. It must also be pointed out that the same colour stability functionality cannot be demonstrated by using dried plasma powder.

The product tested at Chisholm Manufacturing, called a Steakett is a commercial product composed of fresh meat combined with spices, including paprika, and meta-bisulphite. Plasma was incorporated into the formulation as per the matrix table below. Products manufactured were then stored for one week at chiller temperatures and frozen -15°C. At the end of the storage period the products were examined and the degree of colour loss rated by a panel of three, that is the degree of loss of pinkness. Essentially it was concluded that the plasma liquid did in fact improve the colour holding capacity of the meat and if the price of plasma is maintained at the level of meat there would be a marketing advantage for using it.

Matrix of recipe variations for the evaluation of plasma on the colour change of fresh meat Steaketts

Experiment No	1	2	3	4	5	6	7	8	9	10	11	12
Ingredient	%	%	%	%	%	%	%	%	%	%	%	%
Meat	100%	100	100	90	90	90	90	90	90	90	100	100
Plasma				10	10	10	10	10	10	10		
Phosphate					0.5	0.5	0.5					
Flavouring		yes	yes			yes	yes	yes	yes			yes
Water			yes				yes		yes			yes
Sulphite										yes	yes	yes

It was also observed that the combination of plasma and meta-bisulphite more improved colour more than meta-bisulphite alone.

Plasma and restructured meat.
Trials were carried out at Kudos meats in Queensland, and proved to have promising potential. Mark Stokes from South Burnett abattoir was present during the trial runs and this proved to be a most valuable strategy for the promotion of plasma usage in the meat processing industry. Putting ownership for the promotion of plasma usage in the hands of the producer organisation is the ideal method of ensuring the plasma being currently produced will find its way into the industry production system.

The products made at Kudos were essentially restructured meat products. their descriptions are below.
1 Roast beef, consisting of 84.5% beef trim, 90 CL; plasma 15%; potassium poly metaphosphate 0.5%. The meat was put through a 2 inch kidney plate and massaged with the plasma and phosphate for 20 minutes., then extruded into 117 mm diameter casings. This product was water cooked to 70°C for more than 12 hours.
Unfortunately the resulting product showed severe separation after the cook, and it was clear that this process is not the ideal method of cooking. Trials carried prior to going to Kudos indicate that the cooking process should be timed so that the product is removed from the water cookers as soon as the core temperature reaches 70°C, then chilled to about 40-50°C as fast as possible. Not only will this procedure reduce the amount of energy wasted but will control the cooking process better.

From the formulation of the product it can be seen that a roast beef produces as a restructured product, targeted for the institutional food market, has the advantage of being salt free and meat only. Other advantages of a product of this nature are less loss in serving, in that fewer scraps will be produced during the carving and distribution to consumers and the tenderness of the product due to the random orientation of the meat muscle cells.

2 Flavoured beef log, consisting of beef trim 85 CL; 53.1% 20 mm grind, beef trim 75 CL; 35.4% 8 mm grind, plasma 10%, potassium poly metaphospahte 0.5%, flavouring premix 1.0%. This product is similar to the product sold as kebab or yuros. Manufacturing was essentially the same as above in that the meat, plasma and the other ingredients were massaged in a Z-arm blender for 20 minutes before extruded into tube packaging and frozen. The resulting bind was good and clearly indicated the importance of meat particle size in the restructuring process.

3 Beef steak, a product composed of beef trim 90 CL; 29.6%; put through a kidney plate (2 inch), and beef trim 75 CL; 60.6%; cut to fist like size, bovine plasma at 9.2%, and potassium poly metaphosphate 0.5%. Again the principle of manufacture was as above. This product proved to have very good potential in that the bind was good and the product will be assessed further for the institutional market.

4 Beef steak, composed of beef 85 CL; 20 mm grind; 89.9%, plasma 10%, potassium poly meta phosphate also showed proved to be a product with commercial potential.

5 Moulded beef. This product is an unusual product in that it is composed of lean beef cuts about 0.5 kg in size. These cuts were massage with 10% plasma and 0.5% potassium poly meta phosphate. The unusual aspect of the product is that after packaging it is packed into a polythene lined box strapped tight and frozen. In the frozen state the resulting geometrically

rectangular block of restructured meat is slices into 2 mm slices which are packed and are destined for the Asian market. The trial carried out at Kudos Meats proved the fact that too much fat present when large meat pieces are utilised result in a poor bind. Further trials using low fat content meat will be continued in conjunction with South Burnett participation.

6 Hogs Breath Hamburgers. The exact formulation of this product is not available but essentially the hamburger for this chain of restaurants requires the incorporation of liquid egg white. Plasma was replaced and the resulting product was preferred by a small sensory panel at Kudos Meats.

In summary the potential of plasma for meat restructuring and the production of commercial restructured meats is feasible and the Kudos Meat company will be investigating the commercial potential in detail. The real benefit of the trial work was that personnel from the plasma supplier South Burnett participated and thereby developed a commercial link. This strategy is essential if further commercialisation is to continue.

Plasma and pie production

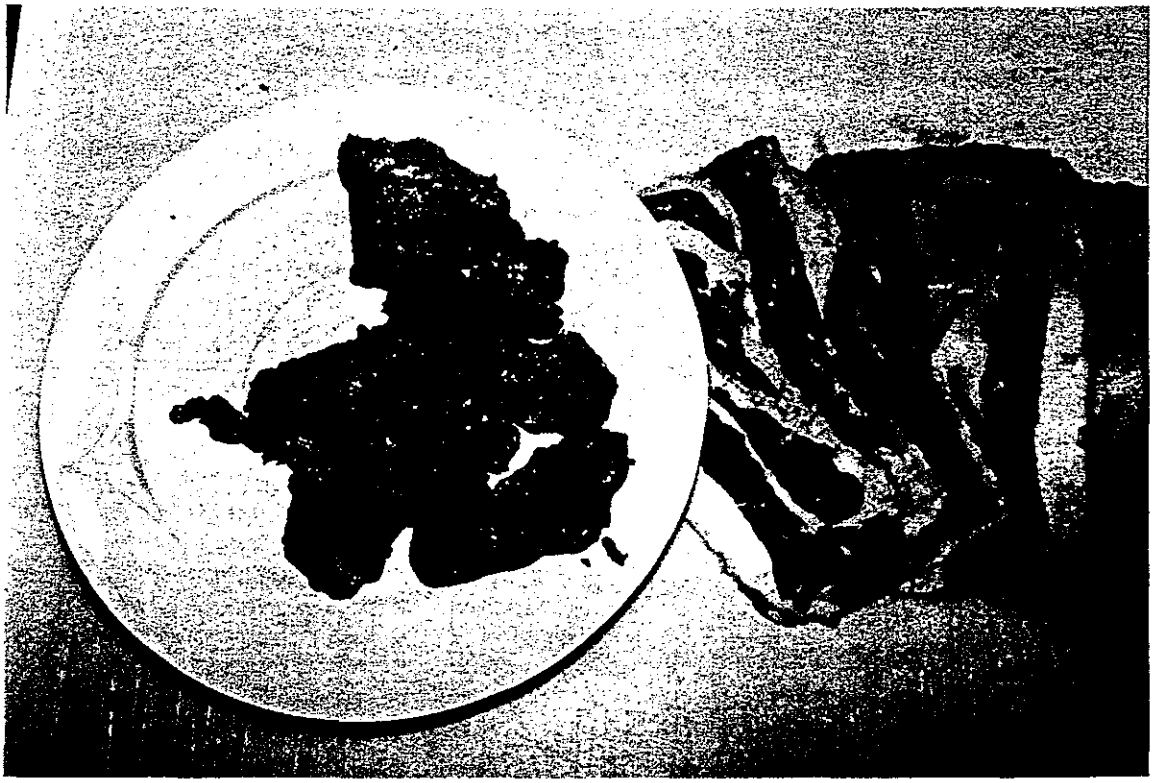
Restructured meat as semi-processed meat blends for further value adding would appear to be a concept with real commercial opportunity. South Burnett could use the plasma collected on site to prepare blocks of restructured meat made to defined fat-to-lean ratios for supply to meat pie and smallgoods operations. These operations would then only have to add the spice blend, emulsifiers etc, and not have the worry of ensuring the smallgoods meat levels are maintained. This problem would be solved by South Burnett. It must also be emphasised that other meat processors could also participate in the development of this new concept in producing a defined and quality meat based raw material.

The meat pie industry was chosen as the industry which I considered most likely to benefit from such a production innovation. To demonstrate the concept further consider the fact that most meat pies in Australia are mutton based. Nearly all meat pie manufacturers use steam kettles to cook the minced meat with gravy mix prior to the depositing into pie shell and baking. This meat cooking process is continuous in that the 'gravy meat mixture ' can stay in the steam kettles for interminable periods, hence the fill consistency of pies commonly experienced b the consumer, that is sloppy. Meat pies do however have to meet legal requirements as to the meat content, and the following example is presented to indicate how a pie manufacturer can utilise simple least costing methods to control the meat blend costing.

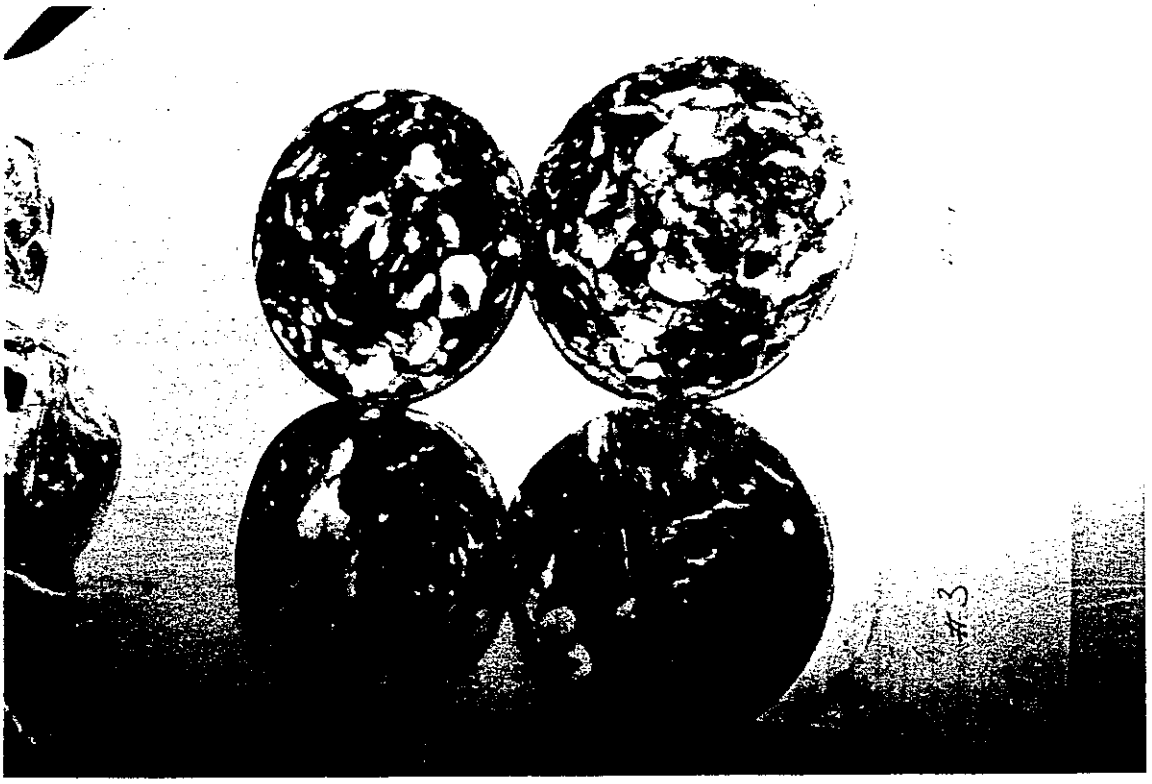
Based on the information about meat and their prices paid by a major meat pie operation the following scenario demonstrates how the least cost pricing process can be applied to meat blends suitable for pie production.

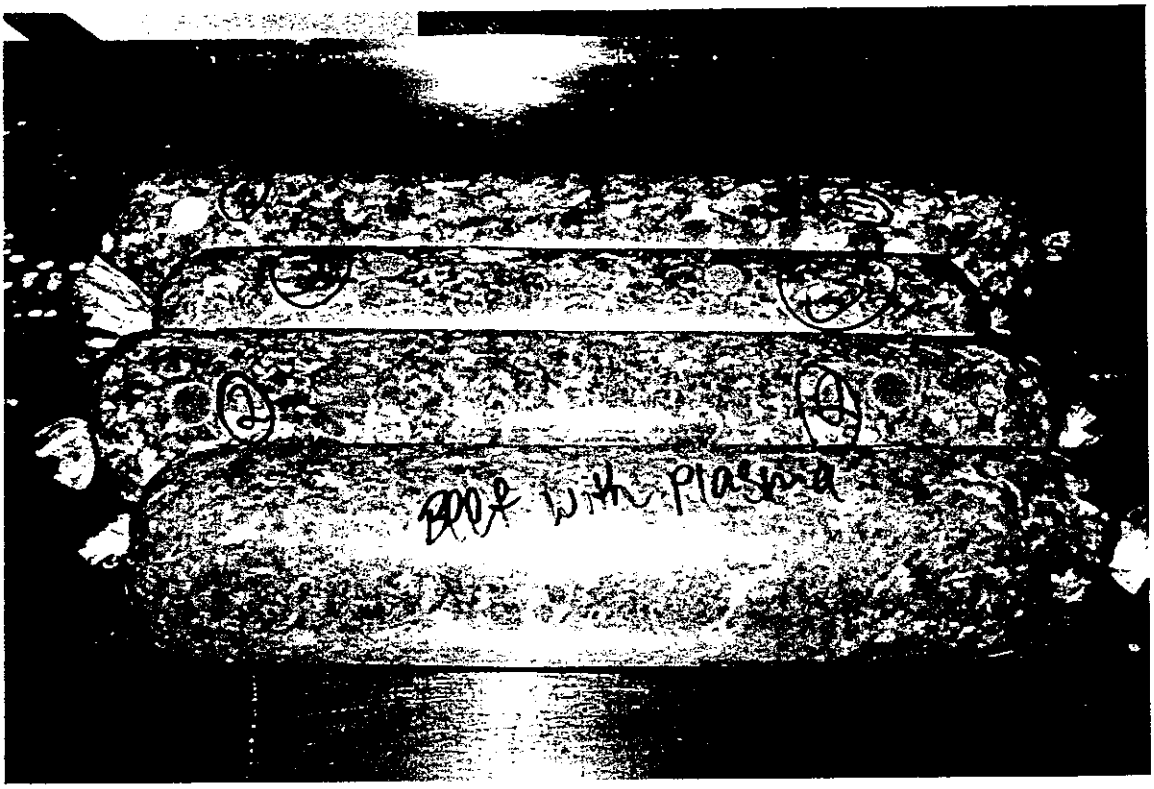
A meat blend commonly used for meat pie production is composed of both mutton and beef. The meat available is Mutton 80 CL @ $1.50 /Kg, Beef trim 75 CL @ $1.65 / Kg, Mutton brisket 50 CL @ $1.10 and Beef shin meat 90 CL @ $0.50. From this it is clear that the mutton at 80 CL could not be used because there would be no beef in the mixture. However if the other meats are put into the least cost calculation it is simple to demonstrate how to put together a mixture of shin meat at 75% and 25% of the mutton brisket. The cost of this 80 CL mixture of beef and mutton is $0.65 per Kg. This mixture will have a protein content of about 19% and about 14% fat. The pie filling desired has to have 15% protein and 20% fat and has to be mixed with the gravy. Fat will have to be added. Applying the least cost technique the

Restructured beef made from large pieces of beef and sliced to 2 mm after freezing for Asian stir fried food.

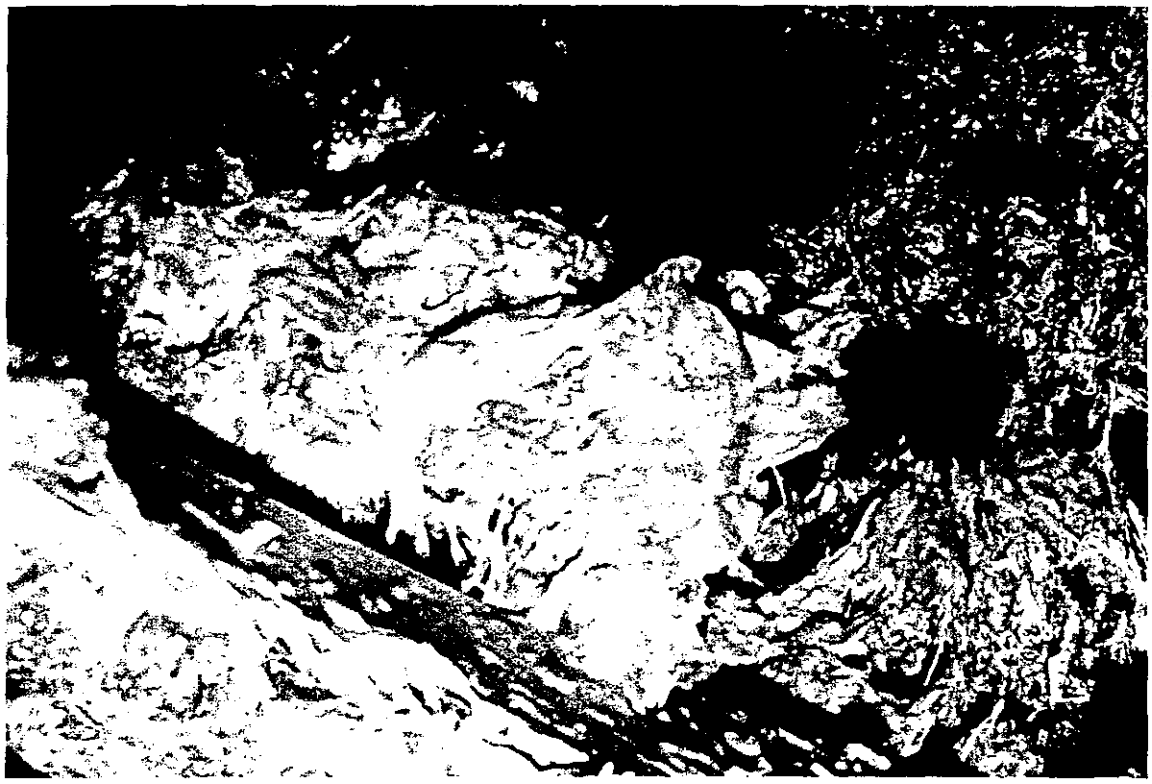


Restructured beef logs prepared from meat ground to different sizes.
Top; cross section after freezing, bottom; beef logs as prepared during routine production.





Emulsification and adhesion character of plasma and phosphate as seen in a commercial massager.

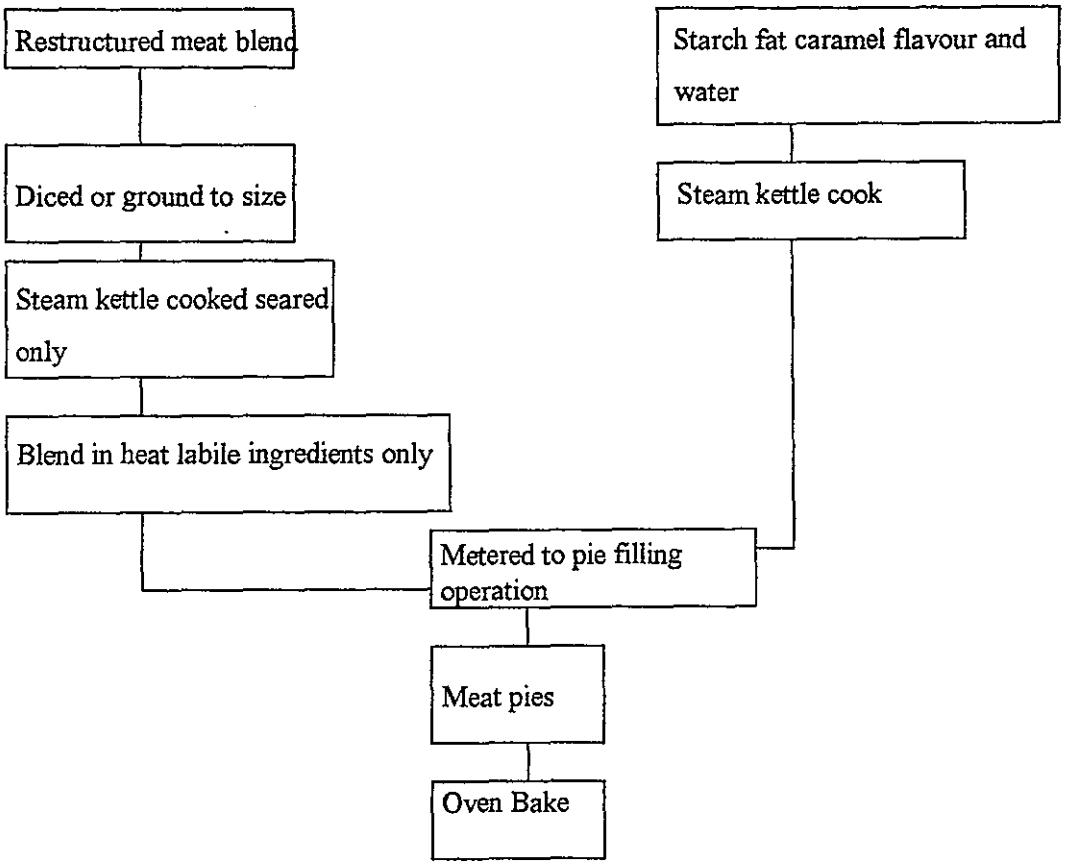


final mixture will be 77.32% restructured meat with 10.31% fat and 12.37% gravy. This mixture will give a filling with a minimum of 15% protein, and exactly 20%. The gravy may contribute some protein but this will be an extra 'give away' amount.

It could be argued, why use the restructuring process to make such a blend to meet not only the best price for the meat but also to control the lean to fat ratio. Because shin meat, generally tough because of the high collagen content, the grinding, massaging and freezing under compression results in a more tender product. The work carried out at Kudos demonstrates how simple the process is and the potential for it not only in the meat pie industry but also for other meat processing operations such as the production of emulsified sausage products and possibly also salami mixtures.

Another aspect of meat restructuring using plasma applicable to the meat pie industry is based on experimentation observations that restructured meat does not need to be cooked for the length of time normally done by meat pie makers. It follows therefore that if pie meat blends are cooked for a lesser time the opportunity to mix in heat labile ingredients such as mushrooms or diced vegetables, a chunkier pie filling can be made with all added ingredients recognisable to the consumer.

Suggested meat production using restructured meat technology enabling a reduction of processing time, use of cheaper cuts of meat and incorporation of labile food ingredients.



The advantage of the system as depicted above is that the meat component can be controlled not only from a composition point of view but also from a cooking aspect. It must be realised that it is not necessary to over cook the meat. The baking pie process also contributes to the meat muscle denaturing. What is also important to realise is the fact that by using mixing calculations it is possible to accurately control the pie contents. Similarly gravy inventory is more accurately controlled.

Application of plasma to the baking process.
It is well established that bovine plasma can be considered to be a egg white replacer. The quantities currently available would not however meet the need. However trials were carried to see whether or not the plasma produced from South Burnett abattoir could be used in the production of bread and pastry.

The major observation made by farinograph measurements, indicate that the incorporation of plasma into flour dough did in fact lengthen the time for gluten strengthening. On the basis of this observation it was thought that bread resulting from dough to which plasma had been added up to 4% would be different to normal bread. This was not the case. Bread containing plasma had similar characteristics to bread without plasma and the flavour and appearance was indistinguishable. What was also interesting was the fact that crumb colour did not indicate the addition of plasma. Admittedly, plasma with a low haemoglobin level was used.

Commercially the use of plasma for bread making does not make sense because of the quantities required. However the use of plasma in pastry making does make some sense. Qualitative experimentation showed that for say meat pie pastry the application of replacement of egg white either totally or by half produce a good pie pastry. Commercial flaky pastry or puff pastry is generally composed of flour and up to about 50% of the flour as fat. Blending plasma at levels of 2-4% of the flour weight and a reduction of the fat by up to 20% produced a similar pastry suitable for pie production at a development level. Crude costing would indicate that this is a significant advantage to the pie manufacturer, however the level of plasma production would be the limiting factor. At present this option can be dismissed because of the limited supply of plasma. However the success of these trials is transferable to making meat/plasma emulsions, and offer the meat industry an opportunity to make more economic use of the fat currently being trimmed off carcases. Plasma can be also used in the emulsification process of the lean fraction of any meat product recipe.

The potential lies with the fresh sausage market. Australians currently eat about 200,000 tonnes of fresh sausage per year. This equates to over 11 Kg of sausage per person per year. If the plasma fat emulsion technology were to be used in 10% of the consumed fresh sausage, at the level of 10% addition to the recipe, 2000 tonnes of plasma would be required per year. In round figures this equates to about 270,000 bovine animals and an approximate return to the abattoir of $3,000,000 if the plasma is sold at $1.50 per Kg. Alternatively frozen plasma/beef fat emulsions could be sold to the sausage industry for controlled addition to meat products.

Other opportunities for plasma
After making further enquires into the potential for plasma in the processed meat industry I now believe the potential can be enhanced even further by application of two new technologies. First there is to potential of reducing the water content of the plasma by membrane filtration. This is based on the importance of the antioxidant feature plasma has over the dried material

and on the fact that if plasma can be sold in the natural state for a cost similar to that of meat, the cost incurred by the removal of water could be justified on the fact that the protein content is increased. This in combination with the very real possibility of gamma irradiation sterilisation of plasma opens the plasma business to further markets. Contact has been made with a commercial radiation firm here in Sydney, Steritech, which will participate in any development work. Currently this company is sterilising container lots of frozen plasma contained in plastic buckets, from New Zealand and a small quantity from Tasmania, at a cost of $7500 per 20 tonnes; (37.5 cents per Kg). This sterilised bovine plasma is exported to Glaxo in the UK where it is used for the production of pharmaceutical preparations.

There is a further option, which is related to the fractionating of plasma. Plasma fractions may be suitable for vaccine production and the medical diagnostic business. Currently fractions from human plasma are prepared by CSL in Victoria. Typically plasma fractions used in the medical diagnostic and vaccine industry sell here in Australia for about $40 per litre. These preparations are sterilised bovine plasma fractions used for tissue culture work. CSL in Victoria does produce small quantities of this material but generally the market is supplied from Europe by a distribution company, Edward Keller and Co. The technology for plasma fraction separation is available and CSL has expressed some interest in a program subject to project definition.

The potential to produce plasma fractions from plasma collected at South Burnett, fractionating it, sterilising it by gamma irradiation and evaluating its potential in the biological and medical diagnostic area is feasible. I have a verbal agreement with a company making and selling tissue lines for viral diagnostics who will be happy to participate in a structured program.

Safety of the plasma from South Burnett

Throughout the project the concerns about the safety of plasma collected from slaughtered cattle was important. South Burnett have been cognisant of this factor and have developed the collection technology which results in a total count of less than 1000 aerobic bacteria per ml plasma. Generally it is much lower. This is a high standard and is less than what would be expected from meat. The freezing process is of course essential and if plasma is to be shipped around the country as frozen flake. Receipt of plasma in a frozen lump would indicate the flakes had thawed and subjected to re-freezing. This would be a warning that the product may not meet specification.

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National Food Authority

Amendment No. 25 to the Food Standards Code

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NATIONAL FOOD AUTHORITY

VARIATIONS TO THE FOOD STANDARDS CODE

(AMENDMENT No. 25)

1. Preamble

The variations set forth in the Schedule below are variations to the Food Standards Code (hereinafter called 'the Code') which was published by the National Health and Medical Research Council in the *Commonwealth of Australia Gazette*, No. P 27, on 27 August 1987, and which has been varied from time to time.

The Schedule contains variations adopted by the National Food Standards Council in February 1995.

These variations are published pursuant to section 32 of the *National Food Authority Act* 1991.

2. Citation

These variations may be collectively known as *'Amendment No. 25'* to the Code.

3. Commencement

These variations commence on the date of publication of this Gazette with the exception of Part 14 of item 3 which will commence no later than 12 months from the date of publication of this Gazette.

SCHEDULE

[1.] Standard A1 is varied by omitting "(3)" from subparagraph (2C)(c)(iv)(I substituting "54".

[2.] Standard A7 is varied by omitting from column 2 of the Table the words 'Corned, cured, pickled or salted meat, and cooked manufactured meat' and substituting the words 'Cured meat, salted meat, manufactured meat or processed product'.

[3.] Standard C1 and *Standard C2* are omitted and the following Standard substituted -

"STANDARD C1

MEAT, GAME MEAT AND RELATED PRODUCTS

PURPOSE

This Standard defines meat, game meat and associated products, and provides standards for the composition, labelling and, in some instances, microbiological specifications for such foods. This Standard specifically relates to mammalian and avian meat. Meat pies and meat and vegetable pies are regulated in Standard C4.

TABLE OF PROVISIONS

PART 1 - GENERAL

PART 2 - MEAT

PART 3 - POULTRY

PART 1 - GENERAL

Definitions

1. (1) Meat is the whole or part of the carcass of any buffalo, cattle, deer, goat, hare, pig, poultry, rabbit or sheep, slaughtered other than in the wild state, but does not include avian eggs or foetuses or parts of foetuses.

(2) Meat flesh is skeletal muscle meat, including any attached fat, connective tissue, nerve, blood, blood vessels and, in the case of poultry, skin.

(3) Poultry is any avian species.

(4) Offal is meat other than meat flesh and includes blood, brain, heart, kidney, liver, pancreas, spleen, thymus, tongue and tripe.

(5) Mechanically separated meat is meat that has been separated from bone by a mechanical process that results in comminuted meat.

(6) Rendered trimmings are the cooked meat fractions derived from the ering of meat trimmings (excluding ligamentum nuchae).

ren Meat

For the purposes of this Standard, meat is stored frozen if its thermal e has been reduced to or below -2°C.

ke and Smoke Flavouring

Any food standardised in this Standard, except for minced meat, may -

(a) be subjected to the action of smoke derived from untreated wood;
(b) contain smoke flavouring.

hibition of Certain Offal

(1) Subject to subclause (2), the following must not be included in any food ardised in Parts 6 to 10 of this Standard:

(a) ears other than porcine ear tips
(b) lips
(c) lungs
(d) mucous membranes not encapsulating offal
(e) genital organs
(f) scalps
(g) snouts
(h) udders
(i) any other meat that is not ordinarily consumed as food by humans.

(2) Mechanically separated poultry meat may contain items or portions of referred to in paragraph (1)(c) and (1)(e) where unavoidable.

ooked Fermented Meat

Any food standardised in this Standard that is sold uncooked and ented must not contain mechanically separated meat or rendered trimmings.

hods of Calculation

The methods of calculation set out in the Schedule are to be used to mine fat free meat and total meat.

PART 2 - MEAT

lth of Animals

Meat is to be derived from an animal that is in good health and condition at me of slaughter.

ection Brands

Colourings may be applied to the outer surface of meat as a brand for the ses of inspection or identification.

Solutions on Primal Cuts

9. At abattoirs, there may be applied to the surface of meat carcasses and to the surface of primal cuts -

(a) a solution of acetic acid in water at a concentration not greater than 3.8 % w/v; or
(b) cetyl alcohol, stearyl alcohol or a mixture thereof, with or without polysorbate 60, or sorbitan monostearate or a mixture thereof.

Enzymes

10. Uncooked meat may contain actinidin, bromelain, ficin or papain, provided the temperature of the meat so treated does not rise above 10°C at any time before retail sale.

Whole Blood

11. Whole blood may contain not more than 10 g/L in total of citric acid, sodium citrate or sodium salts of orthophosphoric acid or a mixture of two or all of them.

PART 3 - POULTRY

Uneviscerated Poultry

12. (1) Uneviscerated poultry must not be frozen.

(2) The label on or attached to a package containing poultry that is uneviscerated must include a statement in type of 3 mm to indicate that the poultry is uneviscerated.

Eviscerated Poultry

13. (1) Poultry in the form of an eviscerated carcass may include the gizzard, heart, liver, neck or a combination thereof.

(2) The label on or attached to a package containing eviscerated poultry which includes gizzard, heart, liver or neck, must include words in type of 3 mm to indicate that the carcass includes that item.

(3) Poultry in the form of an eviscerated carcass may contain up to 5 g/kg of added sodium diacetate.

Self-basting Poultry

14. Poultry may contain not more than 60 g/kg of added edible oil, margarine or butter, with or without herbs, spices or herb or spice extracts.

Limit on Fluid from Thawed Poultry

15. Frozen poultry when thawed must not yield more than 80 g/kg of fluid exclusive of edible oil, margarine and butter, as determined by Method 1 in the Schedule.

Propylene Glycol

16. Poultry must not contain more than 35 mg/kg of propylene glycol unavoidably included in the course of chilling or freezing.

Labelling

17. The label on or attached to a package of poultry or poultry pieces must include an appropriate designation which identifies the species of the poultry.

PART 4 - MINCED MEAT

Definition

18. Minced meat is meat flesh that has been minced.

Prohibition on Use of Additives

19. Food additives must not be added to minced meat.

Requirement for 'Lean' Mince

20. Minced meat described as being 'lean' must not contain more than 100 g/kg of fat.

PART 5 - TRIPE

Definition

21. Tripe is the rumen, reticulum or omasum of cattle or sheep, or the stomach of pigs.

Additives

22. Tripe may contain -

(a) salt
(b) potassium chloride.

Bleached Tripe

23. (1) Tripe may be bleached by treating with a solution of hydrogen peroxide or sodium peroxide and then washing the tripe with an aqueous solution of one or more of the following:

(a) acetic acid
(b) carbonic acid
(c) phosphoric acid.

(2) The pH value of tripe which has been bleached must be not less than 6.5 and not more than 7.5 as determined by Method 2 in the Schedule.

PART 6 - CURED MEAT AND SALTED MEAT

Definitions

24. (1) Salted meat is meat, whether pressed or not, that has been prepared by treatment with salt, potassium chloride or a mixture thereof.

(2) Cured meat is meat, whether pressed or not, that has been prepared by treatment with potassium nitrite, sodium nitrite or a mixture thereof, and salt, potass chloride or a mixture thereof.

(3) Leg ham, unless qualified by the name of another species of animal, is cured meat derived wholly from the hind leg of a pig.

(4) Shoulder ham, unless qualified by the name of another species of anim is cured meat derived wholly from the shoulder of a pig.

(5) Ham, unless qualified by the name of another species of animal, is leg ham or a mixture of leg ham and shoulder ham.

(6) Bacon is salted or cured meat derived from the side of a pig.

Ingredients

25. Cured meat and salted meat may contain -

(a) honey
(b) spices
(c) starter cultures
(d) sugars
(e) water.

Meat Protein Requirements

26. Cooked cured meat and cooked salted meat to which water has been add must contain not less than 130 g/kg meat protein calculated on a fat free basis.

Labelling of Added Water

27. If cooked cured meat, or cooked salted meat, to which water has been added contains less than 160 g/kg meat protein calculated on a fat free basis, the label on or attached to a package containing the meat must include the words 'water added' association with the prescribed name or appropriate designation.

Additives

28. Cured meat and salted meat may contain-

(a) ascorbic or erythorbic acids or their sodium salts or a mixture of these when used as antioxidants
(b) flavourings
(c) phosphates specified in Group II of Table I in Standard A10.

Nitrate in Slow Dried Cured Meat

29. Slow dried cured meat may contain added potassium nitrate, sodium nitrate or a mixture of these.

Limit on Nitrite and Nitrate Levels in Cured Meats

30. (1) Cured meat, except commercially sterile canned cured meat and slow dried cured meat, must not contain more than 125 mg/kg in total of nitrites and nitrates, calculated as sodium nitrite.

(2) Commercially sterile canned cured meat must not contain more than 50 mg/kg in total of nitrites and nitrates, calculated as sodium nitrite.

(3) Slow dried cured meat must not contain more than -

(a) 125 mg/kg of added potassium nitrite, sodium nitrite or a mixture of these;
(b) 500 mg/kg in total of nitrites and nitrates, calculated as sodium nitrite.

Canned Cured and Canned Salted Meat

31. Canned cured meat and canned salted meat may also contain -

(a) agar
(b) gelatine
(c) not more than 10 g/kg in total of modifying agents, except agar, specified in Group I of Table I in Standard A10.

PART 7 - DRIED MEAT

Definition

32. Dried meat is meat that has been dried to a water activity of not more than 0.85 but does not include slow dried cured meat.

Ingredients and Additives

33. Dried meat may contain -

(a) any additives and ingredients permitted by clauses 25 and 28 to be included in cured meat
(b) salt
(c) potassium chloride
(d) modifying agents specified in Group III in Table 1 in Standard A10
(e) potassium nitrite, sodium nitrite or a mixture of these, provided that the dried meat contains not more than 125 mg/kg in total of nitrites and nitrates, calculated as sodium nitrite
(f) up to 1.5 g/kg, calculated as sorbic acid, of sorbic acid, its sodium or potassium salts or a mixture thereof.

PART 8 - MANUFACTURED MEAT

Definitions

34. (1) Manufactured meat is the food, not elsewhere standardised in this Standard, containing at least 660 g/kg of meat, prepared from a blend of meat and other foods including water, and includes -

(a) smallgoods such as frankfurters, saveloys, brawn, devon, strasburg, salami, meat paste, chicken roll and similar foods; and
(b) extended muscle products.

(2) Manufactured ham is manufactured meat, the meat content of which is cured pig meat derived from the hind leg or shoulder, or a mixture thereof.

Casings

35. Manufactured meat may be enclosed in an edible casing.

Ingredients and Additives

36. (1) Manufactured meat may contain -

(a) agar
(b) colourings on external surfaces only
(c) flavourings
(d) modifying agents specified in Groups III and VI in Table 1 in Standard A10
(e) phosphates specified in Group II in Table I in Standard A10
(f) salt
(g) potassium chloride
(h) starter cultures
(i) potassium nitrite, sodium nitrite or a mixture of these provided that the manufactured meat does not, except as specified in subclause 38(1), contain more than 125 mg/kg in total of nitrites and nitrates, calculated as sodium nitrite
(j) ascorbic acid, erythorbic acid, their sodium salts or a mixture of these when used as antioxidants
(k) not more than -

(i) 10 g/kg of glucono-delta-lactone
(ii) 10 g/kg in total of modifying agents, other than agar, specified in Group I of Table I in Standard A10.

(2) Manufactured meat other than uncooked fermented manufactured meat may contain not more than 100 g/kg of rendered trimmings in the meat content.

Sulphur Dioxide in Cooked Manufactured Meat

37. Cooked manufactured meat may contain not more than 260 mg/kg of sulphur dioxide.

Uncooked Fermented Manufactured Meat

38. (1) Uncooked fermented manufactured meat may contain added potassium nitrate, sodium nitrate or a mixture of these provided that the uncooked fermented manufactured meat contains not more than 500 mg/kg in total of nitrites and nitrates, calculated as sodium nitrite.

(2) Uncooked fermented manufactured meat may contain not more than -

(a) 10 g/kg in total of citric and lactic acids encapsulated with palm oil or maltodextrin; and
(b) either -

(i) 1.2 mg/dm^2 natamycin, when determined in a surface sample taken to a depth of not less than 3 mm and not more than 5 mm including the casing, applied to the surface of the food; or

(ii) 1.5 g/kg, calculated as sorbic acid, of added sorbic acid, its sodium or potassium salt or a mixture thereof, with or without polyoxyethylene (20) sorbitan monostearate (polysorbate 60), applied to the surface of the food.

Semi-dry Heat-treated Manufactured Meat

39. Manufactured meat which -

(a) has been heat-treated in the primary package so that all parts of the product reach a temperature of not less than 78°C;

(b) has a pH of not less than 5.5 when determined by Method 2 in the Schedule; and

(c) has a water activity between 0.910 and 0.950 when determined by Section 978.18A-F of the A.O.A.C. 15th Edition;

may contain 1.5 g/kg, calculated as sorbic acid, of added sorbic acid or its sodium or potassium salt or a mixture of these, with or without polyoxyethylene (20) sorbitan monostearate (polysorbate 60), in the final product.

Labelling

40. (1) The label on or attached to a package containing a coated manufactured meat -

(a) which is represented as a meat product either in its name, in a claim or in a pictorial respresentation or design; and

(b) which contains meat in lesser proportion than 660 g/kg of the whole food (including the coating);

must include:

(c) in association with the appropriate designation, a statement specifying the minimum fat free meat content and the maximum total fat content of the whole food (including the coating or other food) expressed as a percentage or proportion by mass; or

(d) in association with the appropriate designation, a statement specifying the minimum total meat content of the food expressed as a percentage or proportion by mass.

(2) Where the label on or attached to a package containing a manufactured meat includes a quantitative statement about the meat content of the food, that statement must be in a form specified in paragraph (c) or (d) of subclause (1).

PART 9 - PROCESSED MEAT PRODUCTS

Definition

41. Processed meat product is the food, not elsewhere standardised in this Standard, containing at least 300 g/kg but less than 660 g/kg of meat, prepared from a blend of meat and other foods including water.

Ingredients and Additives

42. The permissions in clauses 35 to 39 apply to processed meat product as if references in those clauses to manufactured meat were references to processed meat product.

Name

43. Wherever the name of a traditional manufactured meat is used to describe a processed meat product, that name must be qualified in the same size, style and colour of type as that name by the word 'STYLE' or a word or words with similar meaning.

Labelling of Meat Content

44. The label on or attached to a package containing -

(a) a processed meat product; or
(b) a coated processed meat product which is represented as a meat product either in its name, in a claim or in a pictorial respresentation or design;

must include:

(c) in association with the prescribed name or appropriate designation, a statement specifying the minimum fat free meat content and the maximum total fat content of the food expressed as a percentage or proportion by mass; or

(d) in association with the prescribed name or appropriate designation, a statement specifying the minimum total meat content of the food expressed as a percentage or proportion by mass.

PART 10 - SAUSAGE MEAT, SAUSAGE AND SAUSAGE MEAT PREMIX

Definitions

45. (1) Sausage meat is minced meat, mechanically separated meat or a combination thereof which may be combined with meal or flour derived from one or more of cereals, potatoes, legumes or edible starch.

(2) Sausage is sausage meat enclosed in an edible casing or formed into discrete units by other means.

(3) Sausage meat premix is the food used to prepare sausage meat and consists of some or all of the ingredients permitted in sausage meat, other than minced meat or mechanically separated meat but including food additives.

Composition

46. (1) Sausage meat must contain not less than 500 g/kg of fat free meat.

(2) The proportion of fat in sausage meat must not be greater than 50% of the fat free meat content.

(3) Subject to subclause (4), sausage meat may contain other foods, including water.

(4) Sausage meat must not include -

(a) offal other than items permitted in mechanically separated poultry meat
(b) rendered trimmings.

(5) Sausage meat may contain -

(a) flavourings
(b) phosphates specified in Group II of Table I in Standard A10
(c) potassium chloride
(d) not more than 500 mg/kg sulphur dioxide at or after the time of sale where the total meat content does not exceed 900 g/kg.

Sulphur Dioxide

47. Sausage may contain not more than 500 mg/kg sulphur dioxide.

Sausage Meat Premix

48. A label on or attached to a package containing sausage meat premix must include a statement of the directions for use of the premix, such that the food prepared by using the premix in accordance with the directions for use complies with the standard for sausage meat.

PART 11 - EDIBLE CASINGS

Manufacture

49. Edible casings are to be made either from -

(a) the prepared alimentary tract or bladder of an animal referred to in the definition of 'meat'; or
(b) fabricated collagen.

Composition

50. (1) Edible casings -

(a) may contain -

(i) ascorbic acid or erythorbic acid or their sodium salts when used as antioxidants;
(ii) colourings in edible casings for manufactured meats and processed meat products;

(b) may contain at time of use not more than -

(i) 500 mg/kg sulphur dioxide in edible casings for sausages;
(ii) 260 mg/kg sulphur dioxide in edible casings for cooked meat products;

(c) must not contain any residue of sulphur dioxide in edible casings for uncooked fermented manufactured meat at time of use.

(2) Fabricated edible collagen casings may contain not more than -

(a) 220 g/kg cellulose
(b) 2.5 mg/kg gluteral
(c) 200 g/kg glycerin
(d) 50 g/kg white mineral oil
(e) 20 g/kg sodium carboxymethylcellulose.

(3) Edible casings derived from animals may contain not more than 500 mg/k of polyoxyethylene (20) sorbitan monooleate (polysorbate 80).

PART 12 - ADDITIONAL LABELLING REQUIREMENTS

Appropriate Designations

51. (1) 'Cured meat', 'dried meat', 'meat', 'meat flesh', 'minced meat', 'offal', 'poultry' and 'salted meat' are not prescribed names.

(2) 'Steak', 'rump' or 'topside', unless otherwise qualified, must only be used to describe the meat flesh of cattle.

Labelling of 'Fresh'

52. The word 'fresh', or words of similar effect, must not be included on the label on or attached to a package containing meat, or a meat product, that has been stored frozen.

Labelling of Smoke

53. The word 'smoked', or a word or words of similar effect, must appear in type of 3 mm on the label on or attached to a package containing meat, or a meat product, that has been smoked.

Labelling of Enzymes

54. The label on or attached to a package containing meat that has been treated with enzymes must include, in type of 3 mm, the words 'Treated with enzymes, keep refrigerated' or words to that effect.

Labelling of Mechanically Separated Meat

55. The presence of mechanically separated meat in a food must be declared in the ingredient list by use of the prescribed name 'mechanically separated meat'.

Labelling of Offal

56. The presence of offal in a food must be declared in the ingredient list by an appropriate designation other than 'meat'.

Labelling of Formed Meat

57. The label on or attached to a package containing a meat product that is not canned and that has been made from meat that has been minced, sliced, flaked or otherwise divided and reformed in the semblance of a cut of meat, must include, in association with the appropriate designation or prescribed name, the word 'formed', or a word or words of similar effect.

Labelling of Unpackaged Meat and Meat Products

58. If meat or a meat product is offered for sale other than in a package -

(a) the prescribed name or appropriate designation;

(b) any word or words that would, if the food were packaged, be required by subclauses 12(2) or 13(2), or clauses 27, 53, 54 or 57 to be included in the label on or attached to the package;

(c) in the case of a manufactured meat (whether coated or not), any word or words that would, if the food were packaged, be required by clause 40 to be included in the label on or attached to the package; and

(d) in the case of a processed meat product (whether coated or not), any word or words that would, if the food were packaged, be required by clause 44 to be included in the label on or attached to the package;

must be displayed in connection with the food in type of not less than 9 mm.

PART 13 - MICROBIOLOGICAL STANDARDS

Cooked Cured Meat and Cooked Salted Meat

59. Cooked cured meat or cooked salted meat, when examined by Method 3.1 in the Schedule, must have a coagulase-positive Staphylococci count not exceeding 100 coagulase-positive Staphylococci per gram.

Uncooked Fermented Meat Products

60. Uncooked fermented meat products must:

(a) have a coagulase-positive Staphylococci count not exceeding 1 000 coagulase-positive Staphylococci per gram when examined by Method 3.2 in the Schedule;

(b) be free from *Salmonella* in 25 g of the food when examined by Method 4 in the Schedule.

Paste and Pate

61. Paste or pate which is, or is described as, a manufactured meat or a processed meat product must:

(a) be free from *Salmonella* in 25 g of the food when examined by Method 4 in the Schedule; and

(b) have a standard plate count not exceeding 1 000 000 micro-organisms per gram when examined by Method 5 in the Schedule and

(c) be free from *Listeria monocytogenes* in 25 g of the food when examined by Method 6 in the Schedule.

PART 14 - GAME MEAT AND GAME MEAT PRODUCTS

Definitions

62. (1) Game meat means the whole or part of the carcass of any bird, buffalo, camel, deer, donkey, goat, hare, horse, kangaroo, rabbit, pig, possum or wallaby that has been slaughtered in the wild state, but does not include avian eggs, foetuses, parts of foetuses or pouch young.

(2) Game meat flesh is skeletal game meat muscle, including any attached fat, connective tissue, nerve, blood, blood vessels and, in the case of birds, skin.

(3) Game offal is game meat other than game meat flesh.

Restrictions and prohibitions

63. (1) Game meat, except game birds, must be obtained -

(a) from a game carcass which has been subjected to governmentally approved post mortem inspection; or

(b) in accordance with a governmentally approved quality assurance program designed to ensure that the game meat is fit for human consumption.

(2) Game meat offal, except for bone or cartilage attached to game meat flesh, must not be sold as or used in the preparation of food.

Permissions

64. (1) Subject to subclause 63(2), game meat or game meat flesh may be used wholly or partially in place of meat or meat flesh respectively in any food standardised in this Standard or in Standard C4.

(2) The provisions of this Code applying to meat and meat products apply also to game meat and foods containing game meat as if references to 'meat' and 'meat flesh' were references to 'game meat' and 'game meat flesh' respectively.

Labelling

65. (1) The word 'GAME' must be included as part of the prescribed name or appropriate designation, as the case may be, of game meat, game meat flesh or of a food containing game meat or game meat flesh.

(2) There must be written in the label on or attached to a package containing game meat, game meat flesh or a food containing game meat or game meat flesh, and displayed clearly in any advertisement relating to game meat, game meat flesh or a food containing game meat or game meat flesh, the type of game animal from which the game meat or game meat flesh has been derived.

SCHEDULE

PRESCRIBED METHODS OF ANALYSIS

1. Determination of fluid in a package of frozen poultry carcass

Take a double plastic bag of suitable size (approximately 700 mm by 300 mm) and weigh to the nearest gram - called 'A' in the formula.

Place the frozen carcass, still in its wrapping, in the double plastic bag. Without taking the frozen carcass from the double plastic bag, remove its wrapping and any included label. Retain in the double plastic bag any ice formed on the inside of the carcass wrapping or on any included label.

Discard the carcass wrapping and any included label.

Weigh the frozen carcass and the double plastic bag to the nearest half gram - called 'B' in the formula.

Suitably suspend the frozen carcass within the double plastic bag and securely close the neck of the bag around the suspending device. (Sharpened 230 mm hooks made from 3 mm diameter wire are convenient.)

Suspend the frozen carcass and enclosing double plastic bag in an air-space maintained at the temperature of 20 ± 5°C for a period of 14 to 18 hours.

Open the double plastic bag and, without removing the thawed carcass or allowing any fluid to escape, remove and retain any device securing the legs and extract any giblet contained in the carcass.

Drain excess liquid from the giblet pack into the double plastic bag, remove the giblets and suspend them from a wing of the bird by means of a small wire hook. Retain the empty giblet package.

Ensure that all parts of the carcass can drain freely and securely reclose the neck of the double plastic bag.

Weigh the combined empty giblet package and any leg securing device to the nearest gram - called 'C' in the formula.

Drain for a further period of two to four hours. At the end of the period remove the carcass after shaking it to remove any fluid that may be trapped within the bird.

Weigh the double plastic bag and the contents to the nearest gram - called 'D' in the formula.

Where there is no edible oil layer in the double plastic bag:

Use this formula to calculate the proportion of fluid:

$$\text{Proportion of fluid expressed as g/kg} = \frac{D-A}{B-A-C} \times \frac{1000}{1}$$

Where there is an edible oil layer in the double plastic bag:

Carefully pour the contents of the double plastic bag into a centrifuge tube of suitable volume (approximately 250 mL).

Weigh the centrifuge tube and its contents to the nearest gram - called 'E' in the formula.

After centrifugation at 1000 g for 5-10 minutes, remove the edible oil layer with the aid of a pasteur pipette.

Reweigh the centrifuge tube and its contents to the nearest gram - called 'F' in the formula.

Use this formula to calculate the proportion of fluid:

$$\text{Proportion of fluid expressed as g/kg} = \frac{D-A-(E-F)}{B-A-C} \times \frac{1000}{1}$$

2. Determination of pH

Mince a representative portion of the sample of tripe (excluding the seam) or semi-dry heat-treated manufactured meat and place that portion in a stoppered bottle with twice its weight of water. Shake at five minute intervals for 30 minutes and determine the pH value of the liquid electrometrically at 20°C.

3. Coagulase-positive Staphylococci

Proceed in accordance with the current standard method in AS 1766, 'Methods for the Microbiological Analysis of Food', except that when five sample units, each consisting of 100 g or more of cooked cured or cooked salted meats, both pressed and unpressed and uncooked fermented meat products are examined as detailed, the result shall be reported -

3.1 in the case of cooked cured or cooked salted meats as 'not exceeding 100 coagulase-positive Staphylococci per gram of the food' when at least four of the five sample units have a coagulase-positive Staphylococci count not exceeding 100 coagulase-positive Staphylococci per gram and the remaining sample unit has a coagulase-positive Staphylococci count not exceeding 1 000 coagulase-positive Staphylococci per gram;

3.2 in the case of uncooked fermented meat products, as 'not exceeding 1 000 coagulase-positive Staphylococci per gram of the food' when at least four of the five sample units have a coagulase-positive Staphylococci count not exceeding 1 000 coagulase-positive Staphylococci per gram and the remaining sample unit has a coagulase-positive Staphylococci count not exceeding 10 000 coagulase-positive Staphylococci per gram.

4. Examination for *Salmonella*

Proceed in accordance with the current standard method in AS 1766, 'Methods for the Microbiological Examination of Food' except that, when five sample units, each consisting of 100 g or more of paste, pate or uncooked fermented meat products, as the case may be, are examined as detailed, the result is to be reported as '*Salmonella* not detected in 25 g of the food' only when no *Salmonella* has been detected in 25 g of each of the five sample units examined. For the purposes of this method, the sample units may be examined individually or pooled.

5. Standard plate count

Proceed in accordance with the current standard method in AS 1766 'Methods for the Microbiological Examination of Food' except that, when five sample units, each consisting of 100 g or more of paste or pate as the case may be are examined as detailed, the result is to be reported as 'not exceeding 1 000 000 micro-organisms per gram' only when at least four of the five sample units have a standard plate count not exceeding 1 000 000 micro-organisms per gram and the remaining sample has a standard plate count not exceeding 10 000 000 micro-organisms per gram.

6. *Listeria monocytogenes*

Proceed in accordance with the USDA 'FSIS Method for the Isolation and Identification of *Listeria monocytogenes* from Processed Meat and Poultry Products', save that for the purpose of this method, when five sample units, each consisting of 100 g or more of paste or pate as the case may be are examined as detailed, the result is to be reported as '*Listeria monocytogenes* not detected in 25 g of the food' only when no *Listeria monocytogenes* has been detected in 5 g of each of the five sample units. For the purpose of this method, the sample units may be examined individually or pooled.

Samples taken for the purpose of this method must be of the packed product taken at the processing factory or at the wholesale level. Retail samples must not be used for this purpose.

7. Calculation of fat free meat

Fat free meat = meat protein x 4.8

8. Calculation of total meat content

Total meat = fat free meat other than bone (including that from offal, mechanically separated meat and rendered trimmings) + meat fat".

[4.] Standard C4 is varied by inserting the following after subclause 3(4):

"(5) The presence of offal in a meat pie or a meat and vegetable pie must be declared in the ingredient list by an appropriate designation other than 'meat'.".

[5.] Standard S4 is varied by -

(a) omitting "Cooked corned, cured, pickled or salted meat, cooked pressed corned, pressed cured, pressed pickled or pressed salted meat" from column 1 of Table 1 and substituting "Cooked cured or cooked salted meat";

(b) omitting "Manufactured meat, uncooked fermented" from column 1 of Table 1 and substituting "Meat products, uncooked fermented"; and

(c) omitting "Meat paste or spread including pâté or pate" from column 1 of Table 1 and substituting "Paste or pate".

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GENERAL FORMAT FOR AN APPLICATION TO VARY THE AUSTRALIAN FOOD STANDARDS CODE

INFORMATION TO APPLICANTS

This document provides information for applicants wishing to make general application to the National Food Authority (NFA) for the preparation of a food standard or the variation of a food standard. A more specific format document is available for applications related to food additives.

1. **This application format is in 7 parts.** Applicants should address all criteria in the parts specified for their application. Where information is omitted because it is unavailable, or considered irrelevant or inappropriate, applicants should indicate this at the appropriate section and provide a suitable explanation or justification of omission.

2. All applications should be legible and in English. Clear photocopying is essential. The application should be bound in volumes which are easily opened for perusal and evaluation. Individual volumes should not exceed 5 cm in thickness.

3. All applications must be accurately and completely paginated. Pages should be sequentially numbered within part, e.g.
   For Part 1: Pages 1-1, 1-2, 1-3 etc. through to the end of Part 1
   For Part 2: Pages 2-1, 2-2, 2-3 etc. through to the end of Part 2
   For Part 3: Pages 3-1, 3-2, 3-3 etc. through to the end of Part 3
   and so on through to part 7.

   The obliteration of original page numbers on documents included within the submission is not required, provided that those numbers do not interfere with identification of pages within the submission.

4. Four copies of the complete application are to be provided for assessment.

5. If requested to do so by the NFA, the applicant shall supply a sample of approximately 100g (or sufficient for 20 analyses) of any food or food-related material relevant to the application.

6. Applicants may request that commercial information supplied be treated as "commercial in confidence". The National Food Authority may in part or in total refuse this request. If it does so, the applicant will be given the option of withdrawing the application or the relevant sections therein. As a general guide, only information relating to manufacturing processes or marketing strategies will be regarded as "commercial in confidence". Unless confidentiality is requested and justified, material provided in an application will be considered to be on the public record. For ease of handling, applicants are requested, where practicable, to provide information for which such requests are made bound separately.

Applicants are advised that if the Authority decides that information is not "commercial in confidence", that information may have to be disclosed under the Freedom of Information Act should an application under that Act be received in respect of the information.

7. *The National Food Authority Act (1991)* requires that the Authority in developing standards and variations of standards must have regard to the following objectives in descending priority order:

(a) the protection of public health and safety;
(b) the provision of adequate information relating to food to enable consumers to make informed choices and to prevent fraud and deception;
(c) the promotion of fair trading in food;
(d) the promotion of trade and commerce in the food industry; and
(e) the promotion of consistency between domestic and international food standards where these are at variance, providing that it does not lower the Australian standard.

Applicants are encouraged to discuss their intentions, prior to application, with the staff of the National Food Authority.

PART 1 - GENERAL INFORMATION

1.1 APPLICANT

(a) Company name;
(b) Address (street and postal);
(c) Contact (names, telephone and facsimile numbers); and
(d) Nature of applicants business (manufacturer of additive/agent of manufacturer/food processor etc.).

1.2 NATURE OF APPLICATION

(a) State whether the application is to develop a new standard or vary an existing standard.
(b) Is the application made on behalf of a single firm or organisation, or on behalf of the food processing industry or other firms or organisations?
(c) If the application is on behalf of food processing or other industries or organisations, the names and addresses of these parties.

PART 2 - SPECIFIC INFORMATION ON THE APPLICATION

2.1 DETAILS OF THE APPLICATION

(a) Describe the proposed Standard or variation to the Standard.
(b) State the specific type of food(s) (if any) to which the application relates.

2.2 PURPOSE AND EFFICACY OF THE PROPOSED VARIATION

To indicate the purpose of the application in respect to each food for which the application is made, describe the underlying requirements that the new standard(s) will address. For technical issues, analytical data will usually be required to demonstrate efficacy.

2.3 JUSTIFICATION FOR THE APPLICATION

Provide evidence as to whether or not the same objectives can be obtained, for each food specified, by good manufacturing practice (GMP) or by other means currently approved by the Food Standards Code, other than the subject of the application.

2.4 ESTABLISH NEED FOR THE APPLICATION

Provide evidence, such as letters of request(s) from manufacturer(s) of each specified type of food or from consumer groups, indicating the purpose to be served by the application and establishing a need for a standard or a variation of a standard.

2.5 NUTRITIONAL IMPLICATIONS OF USE OF THE PROPOSED APPLICATION

Provide evidence of, or describe, any positive or adverse effects of the application upon the nutritional status of Australians e.g. modification of intake patterns of an essential nutrient.

2.6 DIETARY IMPLICATIONS OF THE APPLICATION

How will the application affect the Australian diet? Normally, the National Dietary Survey of Adults or the National Dietary Survey of Schoolchildren will be acceptable as a source for determination of the "standard diet".

2.7 ADVANTAGE TO THE CONSUMER OF THE APPLICATION

Describe the advantages which will accrue to consumers from the subject of the application.

Indicate any anticipated consumer support for or opposition to the application.

PART 3 - CHANGE(S) TO THE FOOD STANDARDS CODE

3.1 FOOD STANDARDS CODE

Indicate how this application affects the Food Standards Code and identify all standards affected.

3.2 INTERNATIONAL LEGISLATION

Indicate the status of international (Codex) and other national (e.g. US, EC, Canada, Japan) regulation, relevant to the application, of which you are aware. State to the best of your knowledge whether approval has been rejected or withdrawn by any regulatory body.

3.3 CODEX STANDARDS

If you are aware that the proposed new standard or variation of a standard differs from a Codex standard, please give reasons for the divergence.

3.4 NEW ZEALAND FOOD REGULATIONS

If you are aware that the proposed new standard or variation of a standard differs from the New Zealand food regulations, please give reasons for the divergence.

PART 4 - ANALYTICAL PROCEDURES

Where relevant, provide details of appropriate methods by which the effectiveness or otherwise of products subject to the application, may be assessed. Any analytical methods must be presented in such a way that they can be applied, directly, with consistent results, by trained personnel and should be, where possible, such that they can be use for regulatory food control.

PART 5 - DETAILS OF THE REASONING FOR APPLICATION

For each food or food category affected by the application, provide detailed description, reasoning and explanation for the affects.

PART 6 - MANUFACTURE AND PUBLIC HEALTH

6.1 MANUFACI URING PROCESS

Give details of any manufacturing process relevant to the principle of the application;

(a) Give a comprehensive outline of the methods of manufacture; and

(b) Give full details of the analytical controls and quality assurance procedures used during the various stages of these manufacturing, processing and packaging operations.

6.2 PUBLIC HEALTH AND SAFETY

To facilitate assessment of the implications of the application for public health and safety, applicants must submit all relevant human exposure and/or toxicological data available to them (including negative findings). The submissions must be sufficiently detailed to enable independent scientific assessment of the data to be made. Applicants will be required to attest that no significant information has been withheld. Applicants are encouraged to contact the NFA for further details, before submitting their application.

PART 7 - STATUTORY DECLARATION

The information provided in response to Parts 1-6 in the application shall be attested to by a statutory declaration in some suitable form along the following lines:

' I, ... declare that the information provided in this application fully sets out the matters required and that the same are true to the best of my knowledge and belief and that no information has been withheld which might prejudice this application.

Signature

Declared before me.....this.....

day of.....19...

Justice of the Peace or Commissioner for Affidavit.'