Final report

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Frews Lamb Meat in Cooked Meals for Direct Sale (Stage 2)

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Executive summary

Meals designs that contain a high content of meat have been achieved and trialled in direct sale with vending machines in secure and controlled areas. The meals have been based on the meatball range of meals developed in Stage 1:

- Frewstal meat has been blended as a ready to form meat mix according to the recipe for the meatballs.
- The meat mix has been stored in 20Kg cases in frozen form into stock.
- In smaller quantities, the meatball mix has been defrosted, formed into meatballs, and cooked. The cooked meatballs are frozen immediately after cooking and then packed in 10Kg cases for storage.
- Frozen meatballs were supplied to meals producers.
- Meals were assembled against a revised specification and after several iterations, the meals were finalised to include meatballs, sauces and a complement such as rice and pasta, in response to the "voice of the consumer".
- Sites for vending machines were identified and all electronic payments systems with funds transfer introduced in the vending machines at specific trial locations.
- Meals were assembled and sold or given as samples using vending machines in Australia, UK, Belgium and Germany over the period of the trial.
- Off shore meal producer have been engaged and trials in UK, Belgium and Germany were conducted. In each case, pre- and post-delivery inspection of vending units was conducted prior to placement of each machine at location.
- Consumers' acceptance and profiling trials have been conducted including voice of customer as well as assessment of attitudes towards ready meals and vending.
- Adding a complement and operational needs to store bulk product in frozen form adds to the costs; however, the economies of scale and avoiding set up costs by processing small batches in short runs gives significant savings.
- The option to produce meals using frozen meatballs from stock into finished meals is the more cost-effective option and trials have been concluded with costings using both Simple Steps™ and Micvac packaging.
- Consumer response has been positive. A qualitative assessment of VOC (Voice of the Consumer) has been made based on direct feedback at two exhibitions (Brussels Food Expo and IFFA).
- The choice of meals, ease of use and dependability of the total process including equipment performance have been considered. Overall the response had been overwhelmingly positive.
- Potential enquiries for the installation sites and operating licenses have been received from a significant number of companies and individuals who have seen and have had experience of using it in an exhibition environment.
- The meals selection and specification were established as follows:

RK Meals 22 Jun 16	>300g option			>400g option			Sequence of assembly		
15g-16g Meatballs	MEAT No.	COMP. gs	SAUCE gs	MEAT No.	COMP. gs	SAUCE gs	First	Second	On top
Massaman Curry	8	100	100	10	120	120	Meatball	Sauce	Rice
Tamarind Lime ppcrn	8	100	100	10	120	120	Meatball	Sauce	Rice
Tagine	8	70	130	10	80	160	Meatball	Sauce	Couscous
Napoli	8	100	100	10	100	140	Pasta	Sauce	Meatballs

The establishment of a hot quality food in the form of lamb ready meals for retail using all electronic and automatic vending machines has been reached for the first time by this project. Many vending machines operating around the world have been identified, which mostly

provide value foods such as burgers, noodles, pizzas, etc. The focus to provide quality protein foods such as Australian lamb meatball dishes, developed by this project, has introduced new possibilities for this sector of 24/7 food service.

The meatball supply process has been for fresh lamb (82+ CL) to be made into mix and delivered to a location with processing capability to produce cooked meatballs. The cooked meat balls in frozen state were delivered to a meals production facility producing meals adding a complement such as rice and sauce specifically supplied for the meals developed by this project. The assembled meals validated and formally labelled with 30-60 days shelf life were transported to location for loading the vending machines.

Consumer responses were received at IFFA, which included visitors from over 40 countries. At the Seafood Fair in Brussels as well as at LambEx, with close to 1000 delegates some from around the world representing farming, retail, processing, technology companies, research institutions and Universities.

The summary of the feedback is that all who tried the meals were positive and everyone considered the idea of using a vending machine serving hot food 24-7, a great idea. Over 400 people have tasted the meals and more than 1200 people spent time viewing the technology.

Despite considerable (unforeseen) technical problems with international credit card systems and inconsistencies with meal quality, the project has concluded its trials and has **established a first commercial pilot in Australia**.

The strategy forward needs to be based on an Adoption activity, to include:

- Evaluation of sites close to production resource.

- Detailed review of consumer profiles and purchasing habits at such locations.

- Arranging meat ingredient meals and branded meals for meeting the needs of locations and contracting the supply process in suitable packaging to service the clusters.

- Prepare networked and improved vending machines with full telemetry and IT as well as customised customer interface for instanton at locations.

- Collating and analysing sales data to determine further consumer behaviour towards vending of hot ready meals, especially meat based meals, validating the business model on a broader scale.

Proving the business model based on a Stage 3 Adoption of this project will open the pathways for the untapped export opportunities into the EU, US and Middle Eastern Markets, especially in the countries that have similar cultures and eating habits as Australians.

1. Background and overview of the project

To follow up on Stage 1 project (P.PIP.0460) the Frew Group, with support from the MLA-AMPC, has continued with the considerations to diversifying the current portfolio of products and business model in conjunction with BMC. The key objective of stage 2 has been to reach a validated process of supply capability for vending, identifying opportunities and methods related to ready meals positioning of Australian red meat industry.

Four meatball dishes have been manufactured using raw meatball meat from Frews. For confirmation, 9 other meatball meals, in addition to the meals from Stage 1, using standard off-the-shelf sauces were produced. The ranking after a tasting session at Melton confirmed the original selection.

Using Handtmann equipment at Multivac food processing facility, where a small-scale cooking operation has been set up by BMC and Frews, cooked meatballs were produced. Chilled meatballs were used to prepare the meals at Frew using Micvac equipment and later a larger volume was commissioned using prepared meat mix using the resources of challenge meat and Community Chef. Food safety trail and process have been maintained by using licensed facilities and maintaining containment free production and temperature control from the start of the process in Frewstal boning facility in Stawell; through to Frew Group Melton facilities for meatball mix production, and subsequently throughout the whole process of cooked meatball production, chilling or freezing, preparation for meal production, meals assembly and stocking a vending machine with finished meals: the meals having 30 days' shelf life minimum.

It is envisaged that for export, frozen meatball mix may be delivered to facilities with appropriate food supply capability to produce cooked meatballs and meals. Frozen cooked meatballs may be exported to food producers for assembly into meals.

Food safety may be maintained using established and proven supply process. Authorised carriers and licenced food facilities would be engaged after verification of their track record and procedures that comply with regulation.

It is important that the frozen, or the chill chain, process is not broken (outside specified boundaries set by relevant authorities). Procedures using electronic tracking of such parameters are intended once the project concept has been established and proven, post commercialisation.

Pack design and labelling for the meals produced have been a challenge, but achieved, also accommodating the fact that several components were supplied by third parties, including the dry mix for meatballs and the sauces.

Trials have ben performed using a first branded vending machine in a controlled environment at the canteen in Frewstal facility in Stawell. The main objectives of this activity have been to set up and test all the basic supply chain and machine related arrangements that must be proven before progressing to the next stage.

A 3-week trial was successfully completed, with the vending machine having been supplied with meals and feedback received from the staff at Stawell who have tasted the food. The main feedback has been related to price and the lack of a complement, such as rice or pasta as the first batch of meals for these trials included only meatballs and sauce. The feedback has led to the introduction of complements, which included pasta, rice and couscous.

The assessment of the first trial and the feedback highlights the following:

1) The process of setting up the manufacturing and production process to produce meatballs in small batches, maintaining food safety in the supply chain, is feasible. This has been achieved in trials.
2) Vending machine processes are reliable based on the experience during the period of the project so far, but more important, the experience over several years of operation at locations in Europe as reported and observed.
3) Repots in the media over the past year suggest that vending technology for automatic hot ready meals sales is a target for many companies. Consultation with several meals producers indicates that this market is developing fast and several companies worldwide have launched sales of got food in parallel with this project using automated vending machines.
4) The meals used in such machines (launched by other organisations in parallel with the project are generally to a closed consumer set and all have far lower quality.
5) The success of the business, to stem from this project, depends largely on the quality of the food and to a certain degree, pricing. Popularity of meals and delivery at margins with sustainable profitability for all who are involved in every stage of supply chain is key and remains to be tested under broader but structured trials involving real adoption processes.
6) During the project, tasting sessions offering samples to a wide range of consumers produced favourable results. All tasting the product expressed strong likeness for at least two of the four meal types (meatballs with Massaman curry; Tamarind lime; Napoli and Tagine sauces). The results are from a range of locations including Frew Group plant at Stawell, LambEx, IFFA (Germany), Sea Food Expo (Belgium) and open public trial at Sutton Street Store food outlet in Cootamundra.
7) One meal (Meatball with Lime sauce) was ranked top by a large majority, however the Meat ball with pasta and Napoli sauce was best liked by consumers with a more conservative taste and less favour towards spicy meals.
8) The experience of using the vending machine did not pose any issues and all who used the machine were comfortable with the process and the instructions.
9) Waiting time was considered an issue, however, comparisons with the same in the nearby canteen kitchen suggests that the waiting time, on a comparable basis, is shorter in the case of the customer at front of the queue, buying from the vending machine.
10) The best sale performance is anticipated in locations with purchases spread throughout the day and outside normal eating times rather than at peak times.
11) Request for purchasing cold meals was put forward, but this is already a feature of the vending machines and tested in full in Holland, with the addition of a drink selection, also offering a combined meal and drink menu option in the same vending machine.

The work of project and consideration of the status of the market, point to the following:

a) Meal quality and variety is desirable, but costly to maintain. The approach must be to choose a select a group of popular, high quality meals.
b) Vending technology and the feasibility of supply is proven; however, risks remain, which may be better quantified and the approach to their elimination reached through an Adoption Project as a next step.
c) The recipes may need to be altered for different countries, regions or even locations in the same region.
d) Producing a given type of meal or set of meals could meet the expectation of many markets in the same way as McDonalds or Burger Kind hamburgers. Quality ready meals

are considered appealing to several consumer groups, especially working professionals, such as Doctors, Nurses, Lawyers, etc.

e) Meeting individual tastes is an important approach, and this is even more apparent by the "make your own" approach of McDonalds.

f) When vending, having a wide variety of meals is restrictive, influencing (and prolonging) replenishment frequency and overall process. Customers buying, would also spend more time choosing, occupying the machine time, before buying. Having few meals (5-7), but targeting regions and mapping meals suppliers locally to service the machines is a highly relevant consideration. Such have been considered in detail and three models of supply stand out above others:
    - Assemble from raw food ingredients to finished meals in Australia, using long shelf life packaging such as Micvac (60 days unfrozen), and deliver finished meals to distribution locations around the world. Then service vending machines through operations local to clusters of installations in 50km-100km radius zones.
    - Supply ingredients, already prepared in Australia ready for consumption (frozen meatballs), to a meals producer and arrange assembly and distribution in specific countries and regions that services clusters of vending machines.
    - Supply cooked meat ingredients in branded recipe meals to take away stores and arrange for assembly at the store to assemble, pack and distribute locally to clusters of 10-20 machines.

g) Research into identify locations for installing vending machines reveals that consumers need to be targeted and their needs met by recipes that are applicable or appropriate to them. For example, placing a vending machine near an office block in the centre of Sydney, employing staff internationally from countries such as Pakistan, China or France, would have a considerable challenge in satisfying the conservative as well as the specific tastes including Halal. The target business needs to deliver meals with meatballs that generate the highest potential volume of sales at all locations. Once steady state has been reached, diverse recipes meeting the specific needs of consumers at a given location may be introduced.

h) The choice of location is the most important and critical, as is the logistics to deliver chilled food. Using ready meals producers is an appropriate strategy in local regions to deliver products to the "adjacent" consumer pool that can be serviced readily.

i) Several meals producers in Australia, Europe and the Middle East have been identified as potential partners to work with in order to progress the next phases of the project. The strategy towards USA would be formulated, and this may be considered during an Adoption activity, which needs to include the following steps:
    - Evaluation of sites close to production resource. Locations near Producers of Meals in Sydney, Melbourne and Cootamundra (representing a country location).
    - Detailed review of consumer profiles and purchasing habits.
    - Arranging meat ingredient meals and branded meals for meeting the needs of locations and contracting the supply process in suitable packaging to service the clusters.
    - Prepare networked and improved vending machines with full telemetry and IT as well as customised customer interface for instanton at locations.
    - Achieve installations and run supply process operating 2 – 3 Clusters of 5 -10 machines.
    - Producing progress reports every month.
    - Review business case and improve the operations and take necessary action to increase sales.
    - Observe performance and operate the "Adoption Clusters", whilst instigation parallel installations (separate from the Adoption project) and produce comprehensive progress report on Adoption.

- Prepare a launching plan beyond the Adoption project having eliminated the risks highlighted by Stage 2 project.

j) Target locations may include office blocks, rented apartment blocks, such as budget hotels; Universities and Hospitals as identified.
k) An important consideration for the research is the acquisition of data and customer feedback. The process of interactive collection of data may be considered in the Adoption phase, whilst a survey conducted on a personal level at each location.
l) As an iterative process, collecting data and adjusting to the needs of the region would provide indications of sales volume growth and hence the potential profitability of a specific vending machine at a given location.
m) In a progressive manner, information may be analysed with the anticipation that a select set of meals containing high levels of lamb meatballs or similar protein based ingredients from Australia would reach the expected target sales supporting the value proposition estimated at A$52m (see ANNEXE 1).

The target customers are those with little time for preparation and cooking of meals, namely young professionals, nurses, students and travellers on a 2-3 weeks holiday. The expected buying pattern would be 2-3 times per week at a price of AU$ 12.00-15.00 per meal. Reports suggest that companies aiming to launch machines of similar type including in a semi-automatic mode are targeting AU$ 10.00 to A$12.00/meal (see Appendix B).

Forecast sales against demands may be anticipated initially at 50 meals per vending machine per week. Experience suggest that initial sales will be slow and there is a need to engage in promotion activity at each location in the early days to increase awareness. This has been the experience during the Stage 2 trials at locations in Australia and Holland. Vending of hot food surprises many consumers, (especially outside Japan, where this concept is widely in use).

Measures to ensure that out-of-date food is not sold may need to be in place through modifications to the vending machines. Modifications were made in respect of the telemetry and machine monitoring, giving enhancements to the Jofemar vending machines, adopted by the project.

The supply chain process to control safety of the food has been mapped, using existing procedures in food service, as adopted and in practice by ready meals companies. Meals Producers in Australia and overseas already meet the requirements, conforming to legislation. The vending operations also need to comply with the appropriate legislations in food manufacturing and service.

The Frew Group export channels for meat supply already deal with matters of supply integrity and safety in the normal course of existing businesses. The main gap in the process, as identified by the project and resolved by specification of an upgraded vending machine, has been related to concerns over disruptions into the chill chain. The issues have been addressed by modification to the vending technology and procedures for stock monitoring by telemetry.

The most significant issue in the process of supply has been the unavailability of an EU and UAE (or Halal) licenced facility in Australia that can cook the meatballs for export under a commercial arrangement. This is a main reason to proposing the Adoption to begin in Australia, until the export facility for cooking can be identified. A facility for export to the UAE and middle-east has been identified and discussions in preparation of an Adoption project have been initiated. It is envisaged that the Adoption phase would consider broader range of cooked meat ingredients than Lamb Meatballs.

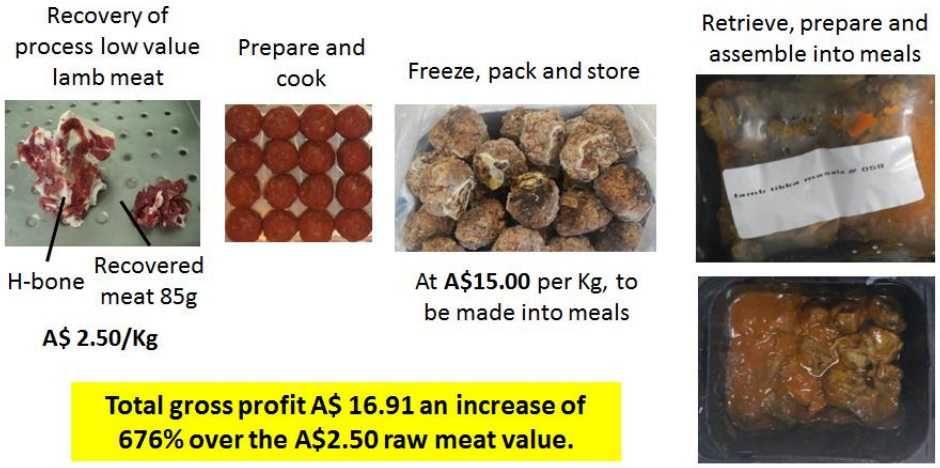
Frew Group and BMC plan to proceed with an Adoption proposal under a Stage 3 PIP project, intending to install and operate up to 10machines in Clusters of 3-5, within Australia to prove the business model with a range of meat meals, to be considered or developed in association with the MLA. The phased of this project are listed in Table 1 Below:

Table 1: MLA PIP proposal Milestones - Stage 3 - Meat meals vending - First adoption in Australia			
M1	01-Feb-18	**Selection and evaluation of potential suitable locations**	
			Country, City, Private
			Other such as oil platforms, mines, hospitals with specific requirements etc
M2	01-Jun-18	**Evaluation of potential sales at each location**	
			Consumer range and consumption patterns
			Competition and complementary vending requirement
			Risk assessment and individual business case for sleeted locations (up to 20)
			Business evaluation and performance prediction to select 1st and 2nd clusters of locations
M3	01-Feb-19	**Implementation and Operation of 1st 5 clusters**	
			Vending machine specification and set up for each location
			Branding and supply process
			Installation and 1st operation
			Collation of sales and consumer behaviour information
			Assessment of sales and consumer information and implementation of any corrective measures
			Continuous monitoring and monthly reporting over 6 months
M4	01-Jul-19	**Implementation and Operation of 2nd 5 clusters**	
			Vending machine specification and set up for each location
			Branding and supply process
			Installation and 1st operation
			Collation of sales and consumer behaviour information
			Assessment of sales and consumer information and implementation of any corrective measures
			Continuous monitoring and monthly reporting over 3 months
M5	01-Dec-20	**Final report including**	
			Business model based on actual sales data
			Strategies for expansion and further adoption
			Experience and approach to supply process structures for export and overseas installations
			Concluding evaluations and reporting

2. Meals supply and validation

In Stage 1, meals using meatballs were developed and tested using vending equipment, establishing parameters relating to the cooking and vending times as well as payment systems.

The process of supply internationally has been examined under Stage 2 estimating the value proposition of Fig. 1, reaching the consumer by installing trial pilots in selected locations.



Cooked meat profit estimate per meal	
2.50	$ per Kg of raw meat
15.00	**$ per Kg selling price of frozen cooked meat**
100	Kg minimum batch size
100.00	$ labour per 100 Kg batch processed
200.00	$ prep and cooking per batch of 100 Kg
10%	loss
50.00	$ per batch for freezing and handling to the point of assembly
350.00	$ COST per batch of 100 Kg with a 10% loss
90.00	Kg of finished cooked meat in final meals after losses
6.39	$ COST/ Kg of cooked meat per 100 Kg batch
8.61	**$ Profit per Kg of Cooked meat from recovered meat**
1.72	$ Profit per meal
Meals sales revenue and profit	
100	Meals sales per vending machine per day
0.15	$ Gate way cost per meal
15.00	COST $ per day against Credit card gateway
100.00	COST $ per day to operate one vending machine
16.00	COST $ per day Merchant costs for Credit Card transactions 2% of vending revenue
1.00	COST $ per day based on $26/month and $600 instal cost of PayPass unit per M/C
25.00	COST $ per day vending machine rent
157.00	TOT. COST per day for operating vending unit per vending machine
1.57	TOT. COST per meal per vending machine
1.77	$ COST against non meat contents and packaging and production, ready for vending
5	Number of meals per Kg of cooked meat
3.00	$ Cost of cooked meat per meal
6.34	$ COST of each meal to be sold in a vending machine to point of receiving payment from customer.
8.00	$ selling price of meals
1.66	**$ gross profit per meal excluding profit from cooked meat**
8.30	**$ gross profit per Kg of raw meat converted into meals and sold in a vending machine**
16.91	*$/Kg of raw meat TOTAL Gross Profit (meals plus cooked meat)*
676%	*Percentage value proposition compared to raw meat price*
	Note that Raw meat price also includes an element of profit.

Fig. 1: Value opportunity from raw to cooked meat in ready meals.

Stage 2 has established the tasks of cooked meatball production on a small scale and preparation of meals and a first trial with a vending machine.

2.1 Product specifications based on Stage 1 — P.PIP.0461

Five meals were considered and tested among those that were developed under P.PIP.0461. Stage 2 has focused on high protein meals from an initial short list for the execution of trials (Fig. 2) - the four meals at the top of the list have been selected in Stage 2.

The approach under Stage 2 initially used meatballs, 32g-36g in weight, composing of 82+ CL lamb as the Frew's recipe. This was later changed to 16g-18g to reflect customer feedback giving preference to smaller meatballs.

Trials have included packaging in Micvac and Simple Steps™.

For a first trial a vending machine located at Frewstal canteen was loaded with meatball meals with Massaman Curry, Tamarind Lime, Tagine, Napoli sauces in Micvac packaging. The main trial was focused on the function and the use of the vending machine as well as the operational factors such as replenishment, shelf life and out of date product. Aspects that relate to the meals and their composition were also a part of the trial, helping the direction for the development of meals.

Meatball meals - Confidentials	Sauces	Flavour	Texture	Spice	Rate
Massaman Curry Sauce.	Indian	EX	V/Thick	2 to 3	5 Out 5
Tamarind Lime Peppercorn Chilli Sauce	Asian	VG	Medium	1 to 2	4 Out 5
Tagine	African	VG	Medium	1	4 Out 5
Napoli	Italian	G	Medium	0	3.5 Out 5
Sweet & Sour	Chinese	G	Medium	0	3.5 Out 5
Smokey BBQ	Australian	G	Medium	0	3.5 Out 5

Fig. 2: Meals from Stage 1 and ranking.

In order to re-confirm the recipes chosen, a separate production was conducted with meatballs and other standard sauces: Fig. 3 presents the results of the trial with alternative meals. The ranking in this tasting session confirmed the original selection of the Frews recipes (the top 4 in Fig. 2).

		Scorers			
	Sauces	A	B	C	Avg
1	Five brothers Bolognese	3.5	3.0	2.5	3.0
2	Arriabbiata with Chilli Pepper	2.5	2.5	2.5	2.5
3	Tikka Masala	3.0	3.0	2.0	2.7
4	Spicy Pepper	2.0	2.0	1.5	1.8
5	Smokey BBQ	2.5	-	0.5	1.0
6	Mongolian Lamb sauce	1.5	2.0	2.0	1.8
7	Madras	3.5	3.0	2.5	3.0
8	Tomato, red wine and herbs	3.0	2.0	2.5	2.5
9	Napoletana	2.0	2.0	1.5	1.8

Fig. 3: Additional trials – meatballs with sauces.

2.1.1 Meals choice for Trials

The final meal selection was chosen from the set in Fig. 2 each meal having 300g minimum weight, composed of 71% meatball, 26% sauce and 3% water. A complement was added to the meal in later trials.

The meatball recipe was developed under Stage 1 on a trial basis and finalised as standard product. The composition is:

> 78% Lamb Mince (82+ CL), 7% Premix (Rice Flour, Salt, Potato Starch, Maize Flour, Sugar, Dehydrated Vegetables, Herbs & Spices, Acidity Regulators (262, 331), Preservative (223 (Sulphite)), Canola Oil, Antioxidant (301), Dextrose (Tapioca, Maize), Fermented Red Rice, Mineral Salts (450, 500)), 15% Water.

Sauce composition

Each of the initial protein and no complement meal types included 26% sauce added to the meatballs. The sauces for the four meals were as follows:

Massaman Curry with Lamb Meatballs

Water, Coconut Milk Powder (Coconut Milk Powder, Maltodextrin (Tapioca), Milk Protein (Sodium Caseinate)), Sugar, Salt, Dehydrated Vegetables, Herb & Spices, Fish Extract, Fructose, Thickeners (1422, 415), Shrimp Paste, Acidity Regulator (260), Canola Oil, Colour (160c), Flavour.

Napoli Sauce with Lamb Meatballs

Diced Tomato, Water, Tomato Juice, Tomato Paste (Tomato, Acidity Regulator (330)), Vegetable Oils, Sugar, Dehydrated Vegetables,
Salt, Acidity Regulator (260), Herb & Spice, Vegetable Extracts.

Tamarind, Peppercorn, Chilli & Lemon Sauce with Lamb Meatballs

Water, Sugar, Salt, Herbs & Spices (Peppercorn 0.9%, Chilli 0.3%), Thickeners (1422, 415), Soy Sauce, Dehydrated Vegetable, Maltodextrin (Maize), Acidity Regulators (296, 260), Fish Sauce, Flavours, Yeast Extract, Canola Oil, Colour (160c), Fruit Extract (Tamarind 0.1%), Vegetable Extract.

Tagine Sauce with Lamb Meatballs

Water, Sugar, Dried Fruit, Thickeners (1422, 415), Dehydrated Vegetables, Salt, Herbs & Spices, Acidity Regulator (260), Dextrose (Tapioca, Maize), Yeast Extract, Mustard Flour, Flavour, Olive Oil, Lemon Peel, Fruit Oil, Colours (100, 160c), Maltodextrin (Maize).

The meals were assembled at the Melton facility and packaged using Micvac technology with the consideration for food safety procedures as legislation and outlined in the next section.

2.1.2 Food safety plan and preparation

In the first instance the requirements of the project have been to consider the standards that must be adhered to in the Domestic Markets and, particularly in Victoria. The plan for the longer term will be outlined in later in this section.

In meeting the requirements for trials, the information in Annexes A, B and C (separate PDF files with this document), relating to the relevant Acts have been noted.

- Food Act report 2013 - Making it safer

- Food Act report 2011 and 2012 - Marking a milestone
- Food safety in focus - Food Act report 2010

Additionally, the Food Act 1984 has been reviewed, which provides the regulatory framework for the food industry to ensure that food sold in Victoria is safe, suitable and correctly labelled.

It is normal for food businesses to ensure that food handlers and anyone else involved with the process do not contaminate the food. Appendix A provides a document that is relevant in respect of handling food. The practices are adhered to in the preparation of the meals in the project, including also:

- Separate utensils were used for raw and ready-to-eat products. Any equipment used for raw foods was cleaned and sanitised before they were used for ready-to-eat and pre-cooked prepared foods.
- It was ensured that all persons who handled food were healthy. No one handling food was ill, particularly with symptoms such as vomitting, diarhea or fever, especially within a 48 hour before.
- Separate hand washing facilities was used by anyone handling food, with everyone ensuring their health and hygiene obligations.
- Health and hygiene requirements of food handlers (Appendix A factsheet) were closely adhered to.
- All premises, including fixtures, fittings and equipment were maintained in a clean condition and all food contact surfaces were sanitised.
- Measures were put in place to receive, store, process, package, transport and, where applicable, dispose of food correctly.
- Practicable measures have been taken to make sure the food is protected from contamination; identified at all times, and kept at the correct temperature at all times (below 5ºC cold and above 60ºC after dispensing).
- All meals were protected from contamination and kept under temperature control.
- Any meal exposed to temperatures above 5ºC for more than 4 hours were disposed.
- 'Food grade' packaging and containers were used to hold as well as assemble the meals.

The food safety process has followed the normal operating procedures that are followed in a food preparation facility with appropriate licences to allow production and assembly for products as needed by the project. The specific practices for facilities, storage, handling methods and transport in respect of the meals for all trials have adhered to food safety procedures, as above, and in accordance with the specific measures below:

- Fresh lamb has been processed and prepared at Frewstal PTY Ltd in accordance with the standards of food safety at that site. Fresh lamb meat at 82+ CL has been bulk packed and transported to Frew Group processing facility at Melton using Frew Group Chill Transport (meeting requirements for safe handling and transfer of such products). Normal operating procedures have been followed, meeting food safety standards for storage, handling, grinding and mixing lamb meat with dry goods and water.
- Meatball mix, 3,600 Kg in 20Kg cases were produced and case packed for frozen storage to meet the overall trial requirements of the project under all milestones.
- A quantity, equivalent to 100Kg of meatball mix was de-frosted for cooked meatball production using a small scale line, arranged at the licenced facilities in Melbourne (Multivac-Handtmann). The transfer of meat from Melton to Multivac has been under strict control to ensure chill temperatures below 5 degrees centigrade to the point of

loading the Handtmann Hopper. Fig. 4 presents the arrangements at Multivac, where a new line for cooked meatballs was assembled for the duration of production of 100Kg.

Fig. 4: arrangements in a food safe facility, cooking meatballs.

- The cooked meatballs were packed after chilling and maintained at low temperature after packaging and during shipment back to Frew Group facility in Melton. The quantity of meatballs required for trial meals were kept chilled and the rest frozen for future trials.

- The assembly and packaging of the meals using Micvac technology was performed at Melton facility, where sealed meals to fill the vending machine for Trial#1 were produced and chilled to below 5 degrees.

- The meals were transported under controlled temperature to Stawell, where the machine for vending was filled. The Vending equipment has appropriate chilling to maintain the temperature of the product below 4 degrees. The Micvac process. Which posturises, cooks and vacuums the packs is described in the presentation of the process later in this report. Fig. 5 shows the Micvac arrangement at Melton for assembly, pasteurisation and vacuum packing.

After the meals were packed and labelled with appropriate ingredient information and use-by-date, they were transported to Stawell for placement in the Jofemar vending machine for the start of the trials.

Fig. 5: Micvac arrangement and meal assembly for Trial#1.

In respect of the food safety for the Stage 2 trials, the following was set in place.

In Victoria

a) Cooked meatballs produced at Challenge Meat, with the facility complying fully with Food Safety requirements and regulation in Victoria. The meatballs in frozen cases were shipped to Community Chef, a local meals producer, keeping full production history records.
b) Meatballs meals were kept chilled at Community Chef and meals assembled within 2 days of receiving meatballs. A shelf life of 30 days minimum was validated and each meal labelled according to regulation. Recipe variations identified as necessary during the earlier trials were implemented including the addition of a complement, which increase the meal weight to 400g, with 16g and better shaped meatballs.

In NSW

In NSW is the arrangement was as that in Victoria. The meals were from Community Chef and shipped to NSW using a chill dedicated van transport.

Export

Food Partners in Belgium were engaged to produce the meal for trials in Europe.

A duty of 16.4% applies to imports of cooked meat from Australia.

2.1.3 Pack design

Packaging of the meals was on Simple Steps™ and Micvac with a minimum of 30-days shelf-life in the production processes that vacuum and pasteurise. In the case of Micvac, a holding tray for vending has been designed which also provide for a fork to be added to the full assembly prior to placement in a vending machine. Fig. 6 presents the final solution from Flavour Station (Nosh 247 Ltd, UK). The packaging format is to be maintained in the specification of the meals to be produced outside Australia using cooked Australian Meatballs. The latest trials indicate that the Simple Steps™ packaging requires more controlled handling and significant re-design of the vending machine internal handling system. To this end, this option has been put on hold and the next stages would focus on Micvac as the best option, especially as the meal reverts back to vacuum after heating and remains sealed, keeping its temperature for up to 20 minutes.

Fig. 6: packaging for hot food vending (Micvac option).

2.2 Vending operation

The project has considered further aspects of vending and the extent to which the technology is becoming accepted and ready for full scale operation. Japan has wide spread use of hot food vending in public areas and reports in Appendix B, suggest launches in Europe and Australia in 2017 by several companies, most of which have not happened, except for a Woolworth's supplied operation that operates in private locations. Most vending machines are expected to be selling the average fast food quality foods such as Pizzas, hotdogs and burgers. The fully automated ready meals vending machines that do not use Micvac, ambient meals or Simple Steps™, which is all such units that are known to be selling, use meals that break their seal during the heating cycle. This poses potential safety exposures. Using the packaging as specified in Micvac or Simple Steps™ remains an important advantageous feature of the meals developed by the project.

Observations in Spain also suggest that several operators such as Nostrum (see Appendix B) and smaller operators close to Jofemar, the vending partner in this project, are selling a range of low priced meals specific to the local tastes to Northern Spain.

German supplies of vending machines and UK operators also claimed imminent launches in 2016, but none have reached the market as yet. Speculations also suggested ready meals becoming available in late 2016 and priced around $10.00 per meal in Australia (See Appendix B).

Vending operation require a clear process flow, fully specified vending machine with features that ensure food safety and a robust process for sales transactions and receipt of payments. The following sections present these aspects.

2.2.1 Process flow

Fig. 7 and 8 presents overall flow and the stages of the process respectively.

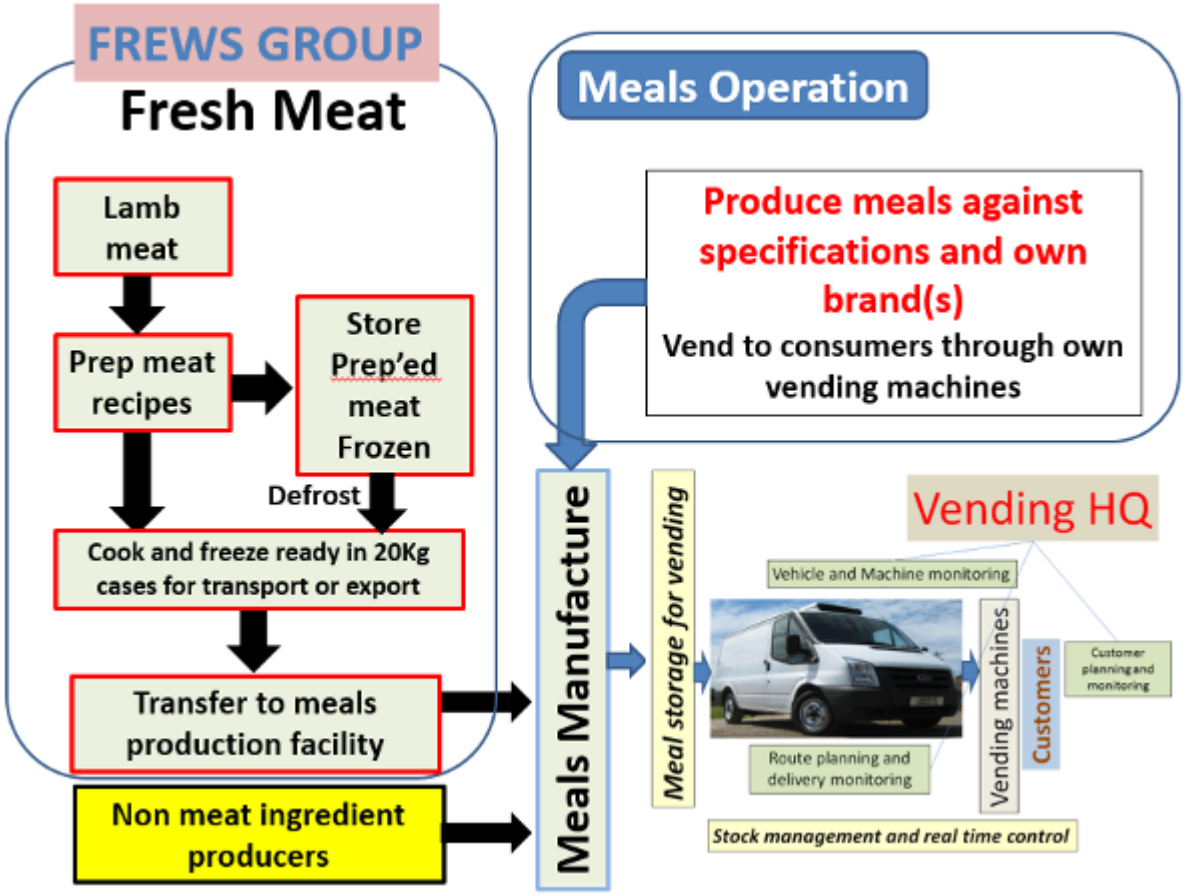


Fig. 7: Overview of the flow

Step	Process	Facility	*Comments*
1	De-bone/recover 82+ CL lamb meat	Existing process at Frewstal	*Use meat from EU licensed facility for export to the EU*
2	Pack fresh meat for transfer	Existing process at Frewstal	*Transfer to meatball facility such as OSI for export to EU*
3	Unpack and grind meat for mixing	Existing process at Melton	
4	Grind and mix meat into raw meatball recipe	Existing process at Melton	*See recipe for meatball (Frew Group Spec)*
5	Pack ground meat into 20Kg boxes	Use liner to ensure hygiene	
6	Ship fresh or freeze for storage	Storage is available at Frew Group	*Meatballs produced off site for EU export to be frozen*
7	Deliver chilled mix to meatball facility	Currently Multivac (relocate as volumes increase)	*and shipped directly to export agent against order*
8	Store chilled meat until required		
9	Form meatball (32g-34g) 30mm diameter		
10	Blanch in 80-90 degree water (60 secs)		
11	Leave to drain for before frying 90 secs		
12	Fry in 180 degree vegetable oil (180 seconds)		
13	Ambient cool for 180 seconds or longer		
14	Chill to reach 4 degree temperature	For shipment to domestic meals producers	*Initially all meatballs may be frozen or just-in-time*
15	Freeze for export to Middle East or USA	For export or for stock (also to domestic supply)	*delivered in small volumes for domestic operation*
16	Ship to meals producer	Fresh to Community Chef-Frozen to USA-UAE	*To EU, ship frozen direct from EU licensed facilities*
17	MEALS PRODUCER TO ASSEMBLE MEALS		
18	Deliver meals direct to Vending machine	Locations to be close (within 50-80km)	
19	In the replenishment process uses telemetry	Telemetry defines stocks to be replenished	*Out of date stock to be removed*
20	Clean machine once/week when delivering		

Fig. 8: Process steps from raw meat to vending meals hot.

The main stages are recovery or production of raw meat to the point of grinding and mixing for the meatball recipe to be available as bulk packed fresh or frozen meat (Steps 1-8, Fig. 8). The meatball production to the point of cooking would follow to reach frozen or chilled cooked meatballs (steps 9-15, Fig. 8) following the initial production as set up with Handtmann meatball machine in Fig. 4.

For production of meals in respect of trials and beyond, the meatballs, as standard product, may be delivered to meals producers for assembly and packaging of meals for delivery to vending machines (steps 16 and 20, Fig. 8). It is envisaged that the meals companies with appropriate training shall arrange for the replenishing of the vending machines at locations close to their facilities using their own chilled transport facility. It is important to emphasise that all meals in this project, being or to be delivered to vending machines are safe to be eaten cold, but are intended to be stored in the vending machine fresh for microwave heating by the machine, dispensing the meals hot.

There is a requirement for Halal specification to ensure all meals meet with the community desiring such meals. It is identified in the course of the research that serving Halal products can give a competitive edge in specific locations in Australia, Europe, USA and a mandatory requirement in the Middle East.

2.2.2 Specifications for vending machine

In the process of evaluation of the vending machines a number important features have been identified as important, but lacking. Jofemar, Spain undertook to upgrade their machines accommodating the requirements of this project.

These include:

1- Fridge temperature monitoring – The machine has an out of range indicator and an “unsafe status" monitor, which disables the machine from selling once the temperature goes above a specified limit. It is required that the means to set the temperature parameters is provided. This is also to allow the information to be transmitted by wireless communication for a remote-control decision to override the machine if such is considered appropriate. In addition, a temperature log is needed for

printing and documenting as a QA procedure for each machine. Such features are to be added and are added to a newly commissioned machine. Note that several other vending machines considered by the project, and currently in use, lack the temperature logging feature as well as the remote overrides. Machines missing such features would compromise the food safety in critical situations.

2- Cooking cycle failure may result in a cold meal to be dispensed. It is important that a sensory feature is added to warn the buyer and to refund the purchase. This feature is under consideration for inclusion, however a microwave failure is detectable and may be used as a new feature to stop the machine and refund the buyer.
3- Electronic display is to be enhanced with simpler HMI for buyers and vending operation. This has been achieved by the project and enhancement will be implemented if an Adoption project is to be executed.
4- Stock management is to be introduced to ensure that meals sold are updated in a remote log with an "out of stock indicator" for each meal on the main display. This is also important in the planning of replenishment. This has been achieved during the project by Nosh 247 and its supply base.
5- Easy loading and replenishment management would ensure that person loading a machine cannot make a mistake. Use of electronic instruction is being considered (for Adoption) in order to reduce the level of skill and concentration needed during recovery of out-of-date meals and replenishment.
6- An out of date meals and meals reject hold buffer is needed in such vending machines, but currently unavailable. Also, a process for offering meals for free just before the use-by-date may be a useful option for consideration. There is a need to upgrade the telemetry for stock control to include date information and allow on-the-spot promotions, especially for meals close to use by date.
7- The process of refund using an alternative payment system solution, implemented during the project has been a major milestone, however, the process of refunding in the event of a jam, not otherwise recognised by the vending machine control software, remains an issue.
8- Adding a card system has been achieved (see next section); however, a process for charging buyers in international locations using a card system that is installed at the point of machine manufacture and testing is important. The project has now reached this capability with Jofemar and Nayax.

In total 5 machines have been commissioning and there is sales experience documented, but not all the meals have been possible with Frew's Meatballs, given the issue with production of meatballs at a licensed facility.

2.2.3 Electronic sales data and payment

Two card operators have been engaged in the project and all machines can now be fully CASHLESS (see Fig. 9). The vending machines with credit card readers have been successfully used by a large number of vending companies, however in the case of CPI, the long vend operations remain a problem, which was solved by the project as a one off prototype, this is now available for Australia under special agreement. See also Appendix C.

Fig. 9: CPI card system commissioned and tested.

2.3 Domestic trial

The vending machine initial trials required to assess the following:

a) User friendliness and ease of buyer's interaction with the machine
b) Reliability of the machine in keeping temperature and delivering hot food over a long period
c) Reaction from the group of consumers at the location of the trial.

2.3.1 Location and vending unit

The first location of the of the Jofemar vending unit was in a controlled area at the Canteen of Frewstal, where over 400 staff have access and several of whom work outside normal hours.

The machine available at that time was set as a cash only machine and was suitably presented with instructions and labels to conform to requirement of vending hot food.

Fig. 10 shows the machine at location.

Since initial trial at Frewstal, installations of fully cashless machines with digital screen and without have been trialled at the following locations:

- Seafood Expo Brussels
- IFFA, Frankfurt
- Sutton Street Store, Cootamundra
- Regus Amstel - Amsterdam
- Food Partners, Belgium
- LambEx Australia
- SoiDeli Amsterdam

Fig. 10: Jofemar machine at location in Frewstal.

2.3.2 Production of meals for trial

The meals presented in Fig. 11 were produced to fill the machine. These meals were used in trials at locations in Germany, Belgium and Australia only, although the meatballs for Europe could not be sourced from Australia given the issue related to unavailability of EU licensed facility for cooked products as mentioned earlier.

Meatball meals - Confidentials	Sauces
Massaman Curry Sauce.	Indian
Tamarind Lime Peppercorn Chilli Sauce	Asian
Tagine	African
Napoli	Italian

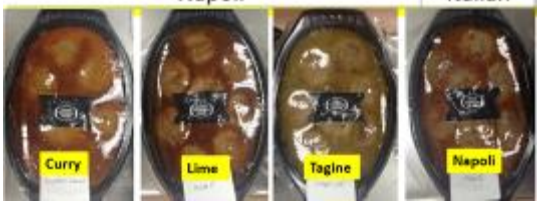


Fig. 11: Meals produced in Micvac trays for vending at Frewstal.

In total 80 meals were stocked to facilitate the initial trails. After an introduction to staff at Frewstal over several tasting sessions, 60 meals were left in the machine for an unattended period of 10 days. A questionnaire (See Appendix D) was left for staff to complete in order to receive reactions.

2.4 Analysis of initial trial

The analysis has been performed by:

- Direct feedback from those who used the machine
- One to one feedback and group feedback on the meals
- Questionnaire completed and returned during the unattended period.

Vending Machine Operation

- No issues in respect of the machine operation were noted.
- Machine operated reliably in all respects, including, vending process, chill temperature and microwave cooking.
- Reactions in respect of the ergonomic process for selection, payment system, waiting time and retrieval of cooked meals was positive in the feedback.

Meals

Feedback in respect of the meatballs themselves have been positive by all who tried the meals. The specific feedback in respect of the sauces during the trial were as follows:

Massaman Curry with Lamb Meatballs

- Liked by several people, but the conservative eater has found it too spicy and one person commented on it being too salty.
- Sauce was considered too thick.
- The majority would prefer to have a complement such as rice.

Napoli Sauce with Lamb Meatballs

- Appealing to everyone, especially the conservative taste consumer.
- All who tasted it recipe suggested a pasta based complement.

Tamarind, Peppercorn, Chilli & Lemon Sauce with Lamb Meatballs

- Considered the top tasting recipe by everyone who tried the meal.
- Enhancement with a rice complement was highlighted.

Tagine Sauce with Lamb Meatballs

- Another recipe appealing to the consumers with a taste for mild food.
- Complement such as chip peas or lentils would enhance the appeal.

The feedback at Stawell gave important information in respect of the lamb recipe. Feedback has been positive from those who tried the machine and purchased meals. In a dedicated tasting session with over 30 staff the range of selected sauces were considered very appealing and meeting different tastes, thus likely to appeal to a wider range of consumers. The need for a complement such as rice, vegetables or pasta was highlighted and new meals were designed for implementation.

2.4.1 Overall feedback

The following were the initial reactions:

- The meals selections provide for the range of tastes. The conservative mild taste, preferring the Napoli dish and the extreme spicy taste, liking the curry.
- The most popular dish among the people tasting in a tasting session was the Lime.
- Many buyers pointed out a preference to have the meatball and sauces with a complement such as pasta or rice.

- A few indicated that they wish to have the option to buy cold and heat at home, perhaps using a complement to serve two people from the one pack of 300g. A 300g pack was suggested to become a 400g meal by several staff members and to add rice, pasta or similar complement.

Feedback at IFFA, LambEx and Cootamundra has been positive and along the same lines, except that at Cootamundra the most preferred meal has been found to be with the Napoli sauce and pasta. The focus of future sales at this location will thus on this meal.

2.4.2 Target market and review of meals design

The target market assumed demand for a high protein meal, which remains the case, however it is considered that a 400g meal would allow for a more substantial meal and the addition of a complement.

A review of the meals was considered appropriate. It is proposed to add rice to the Meatball dish with Massaman Curry and Tamarind Lime, couscous to the meal with tagine and pasta to the Napoli dish.

2.4.3 Target customers, and location

In addition to targeting factories and apartment complexes, Office blocks, Hospitals, Universities and Hotels without restaurants may be targeted in all trial countries. Students, holiday makers, office and factory workers and hospital staff are the main target customers.

Five vending machines have been implemented and trialled in different parts of the world with meals, but meatball meals using Australia lamb were used on Australia only.

2.4.4 Design for data analysis - voice of customer

The feedback from trails, based on the questionnaire of Appendix E have been summarised in Table 2.

Results of meals trial#1 at Frewstal				Mar-16
Machine use				
Very hard	hard	Average	Easy	Very easy
0%	0%	33%	22%	44%
Temparuture				
Way too cold	Too cold	Just right	too hot	Way too got
0%	0%	100%	0%	0%
Waiting time				
Very quick	quick	Not bad	Too long	Way too long
0%	33%	67%	0%	0%
Satisfaction				
Not at all	Not satisfied	Somewhat	Satisfied	Very
0%	11%	11%	33%	44%
Value				
Very good value	Good	Reasonable	Expesnive	Very expensive
11%	11%	33%	33%	11%
Return customer				
No	Yes Occasionally	Regularly (weekly)	Often (2-4/w)	Everyday
0%	63%	25%	13%	0%

Table 2: Analysis of feedback from Stawell.

Important market considerations during the project in the early stages were documented as follows:

Market access and supply chain

The route to the market is to be achieved by establishing a supply chain with existing meals producers, capable of producing a variety of recipes including the final rage of Frews meals, containing 180g-220g of lamb meatballs in 350g-400g packs.

In the Australian supply process several Meals Producers provide the channel for supplying meals in, once the consumption figures increase to a point where economies of scale are reached by large volume of sales. The opportunity also provides for other red meat recipes to be introduced, beyond the current selection of meals, once clusters of vending operations are established.

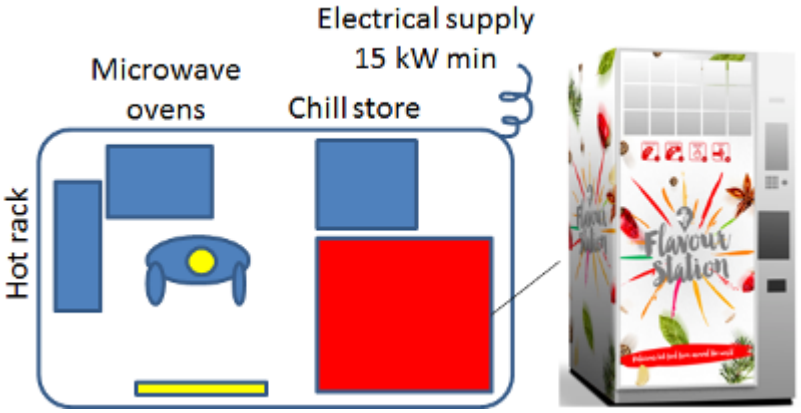
Product and business concepts

There are several products and business concept from the project.

a) Meals that use high levels of protein. These may be sold direct to food service or other forms of retail, including semi-automatic vending machines.
b) Vending business involving installation and operation of only automatic vending machines delivering high protein ready meals hot to end consumers. This would be parallel to the concepts by Nostrum and similar businesses already established.

c) Branded franchise business involving a limited number of meals, a hot food vending machine integrated with other vending machines as ASDA example below:

d) A hot food retail shop delivering ready meals over the counter at peak eating times and an adjacent automatic vending machine:



The success of each concept for retail will depend entirely on the positive consumer reaction to the meals. There is also the acceptance of meals from a vending machine, which is generally associated with lower grades of food. For example, the product form Subway as Fig. below:

The challenge for the project would be operating a vending concept with a profile that can reach a critical size of operation with a growing channel of supply (see Appendix B) and with meals that are liked by a wide large group of consumers. The location of the machine has an important influence on the success to reach the consumers with a taste for the meals being supplied.

3. Retailing hot ready meals and reactions

Separate vending equipment has been specified, acquired, transported, installed and operated at various locations both within and outside the brief of the project for trials.

The main purpose of the trails has been to observe consumer reaction to an automatic hot food retail process as well as vending reliability. The reactions are presented below:

3.1 Reaction to automatic retailing of hot food

In total over 800 people have been in contact with the concept of the project during the phases of the milestones. These also include individual that have an interest to use the machine in their businesses.

Everyone who used the machine had a positive attitude towards the technology. The fact that quality foods would be available for purchase hot 24/7 is particularly appealing.

3.2 Reaction to recipes (especially meat based and the Australian Meatball meals)

The vended meals were received positively and a significant number (over 75%) of individual tasting the meals state that they would return.

The meatball meals were considered tasty and of high quality. The most significant feedback related to the large size of the meatball, which is subsequently modified to 16g in weight form 32g. This helps the meatball to be picked and eaten in one step rather than in two bites, which is important in a takeaway process.

3.3 Reaction to the payment process

The electronic payment process is established widely and everyone using the credit card unit on the vending machines had no difficulty.

During the trial, the only surprise has been the rejection by the system of MasterCard credit card from a German bank. Card transactions from the following countries have been registered as functional from the trials:

- United Kingdom
- Australia
- Chilli
- Spain
- Holland
- Denmark
- Iceland
- UAE
- Singapore
- France
- Belgium
- China
- Japan
- Switzerland
- Sweden
- USA
- Russia
- Italy

3.4 Reaction to vending selection process

Two versions of human interface for selection of meals has been trialled. The first uses a method where the operator selects the meals with the information about the meal and the selection code presented on a printed display card inserted in a pocket inside machine, which can be seen on the front panel. A touch keypad is used to make the selection as on any vending machine. The second method has the meal information on a LCD screen which is electronically programmed and changed. The selection uses the same touch keypad.

A touch screen approach has been considered and may be introduced, however studies suggest that such screens have high wear and tear and reliability issues. A console separately mounted adjacent to the machine with touch screen search capability is considered a better approach. This is based on feedback from the trails where several individuals purchasing meals attempted to use the normal screen as a touch screen for selecting meals. The separation of the ordering screen from a search console also prevents build-up of queues in front of the machine at busy times.

3.5 Reaction to vending time

Everyone considered the vending time as acceptable. The trial reveals that the customers would watch adverts or material displayed on the screen if such option were available. This also points to an opportunity for advertising and a separate business opportunity, when numbers of machines in the field expands the volume of consumer contacts to the level that supports advertising sales as an income stream.

3.6 Feedback on ease of use

No one using the machine has any difficulty.

3.7 Feedback on repeat use

All who used the machine stated that they would use the machine if the standards of food were maintained. A significant number of the returning buyers who tried different meals in a tasting session chose their favourite meal more than once on repeat visits over 6 days at IFFA.

The retailing of hot ready meals remains a new concept, however the project has demonstrated the capability and has removed many of the technological obstacles. The key issues remain in the food supply process including export from licensed facilities and the fact that there are no such facilities for cooked products that have been identified yet. The specific lamb meal trials have been successfully presented with positive reactions at various events, including:

a) Brussels Food Exhibition (April 2016) – selected as a first opportunity for presenting Flavour Station as a concept. The target was to seek reactions and new leads for multiple installations at locations in Europe. Locations in Belgium and Holland were identified and being explored.

b) IFFA 2016, Germany, an international event where many Card transactions were tested (as simulated tests), using the hardware and card communication systems

installed, but without actual charging. At this even, the lamb meatball meals were also tested for the first time.

c) LambEx 2016, Australia, where a similar exercise as (b) was repeated, but only with Lamb Meals including the meatball recipes.

Figs. 12a, b and c show the installations at each location a, b and c above, respectively.

(a) Belgium **(b) Germany** **(c) Australia**

Fig. 12: Installations in (a) Brussels, (b) Frankfurt and (c) Albury.

Subsection below present the key aspects of the vending technology developments related to the project:

3.8 Telemetry

Two specific aspects of vending technology enhancements have been established:

a) Telemetry to allow remote monitoring of stock movement in real time on multiple vending machines, which would provide the means by which stock management can be performed including the processes of order processing and replenishment. In addition, operating status, such as machine faults or jams, temperature monitoring of the chill section (keeping meals below 4 degrees centigrade), and reconciliation of sales against credit card transactions may be performed.
b) Credit card and merchandising installation, commissioning and testing for commercial operation (this was finalised after a specific visit to the supplier's R&D centre close to Philadelphia, USA).

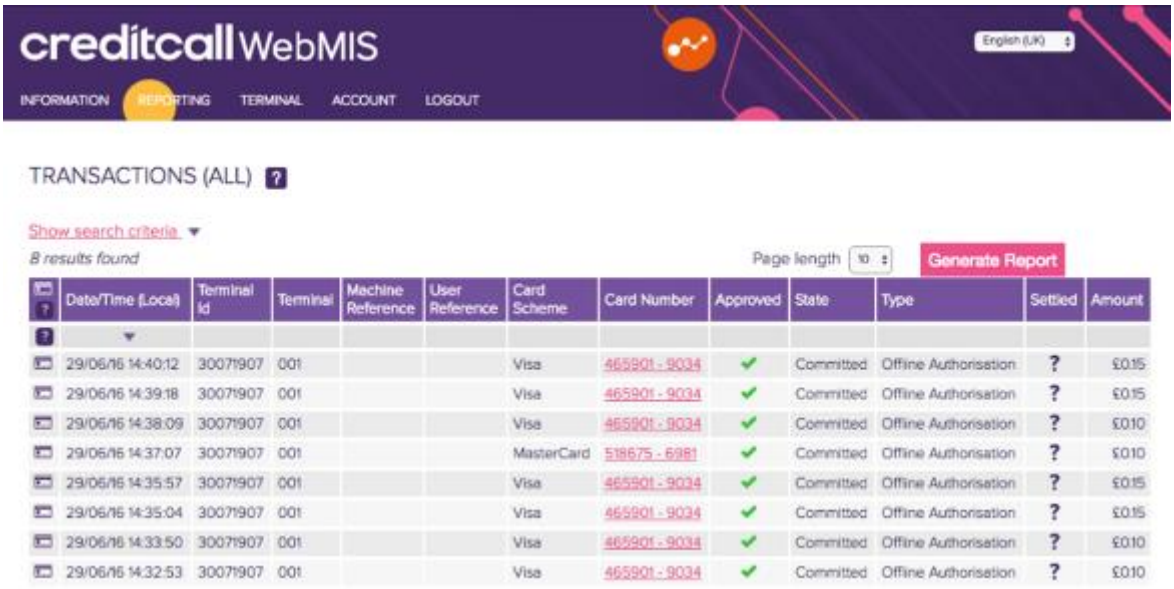
The commercial operation of credit card system has been surprisingly problematic. Certain credit cards were not charged, even though the meal has been delivered, under the current systems of operation, involving greater than 60 second vending time. The matter was resolved after extensive testing and review of technical documentation. A new process of testing was

devised to troubleshoot the matter despite the fact that the level of complexity and effort had been beyond the resources or scope of the project to correct.

Figs. 13, 14 and 15, shows the results of trials with the telemetry system, highlighting the completion of the process with credit card types, issued outside Australia, which have been tested for correct function.

In order to perform trials, the brand names, Flavour Station, Flavour Box and Flavour Hub have been introduced with Nosh 247 Ltd driving the implementations. The Figs. 13 give the results using Nosh247 account for the transactions on the card machines in Europe.

The tests on the system in 2 locations (UK and Australia) were successfully completed and except for the complication with Australian credit cards, mentioned earlier, the systems of telemetry and card reconciliation have been completed including installations in UK and Australia. Simulated sales trails have been conducted in Germany and Belgium.



Date/Time (Local)	Terminal Id	Terminal	Machine Reference	User Reference	Card Scheme	Card Number	Approved	State	Type	Settled	Amount
29/06/16 14:40:12	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.15
29/06/16 14:39:18	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.15
29/06/16 14:38:09	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.10
29/06/16 14:37:07	30071907	001			MasterCard	518675 - 6981	✔	Committed	Offline Authorisation	?	£0.10
29/06/16 14:35:57	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.15
29/06/16 14:35:04	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.15
29/06/16 14:33:50	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.10
29/06/16 14:32:53	30071907	001			Visa	465901 - 9034	✔	Committed	Offline Authorisation	?	£0.10

Fig. 13: CreditCall Transaction for 7 items on Visa card ending 9034 and one transaction on MasterCard

SALES ACCOUNTINGS DETAILS 29/06/2016 15:41:34

CHANNELS SETUP	PRODUCT	DESCRIPTION	NUMBER	PRICE	SORT
11	11	Chicken Teriyaki Wok	2	0.1	NORMAL SALE
18	18	Chicken Risotto	2	0.1	NORMAL SALE
21	21	Duck Confit	2	0.15	NORMAL SALE
22	9999	DESCONOCIDO	2	0.15	NORMAL SALE

Fig. 14: Sales ransaction on telemetry ledger 29 June 2016 for all 8 sales of Fig. 13.

30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.15	£1,999.10
30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.15	£1,999.25
30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.15	£1,999.40
30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.15	£1,999.55
30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.10	£1,999.70
30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.10	£1,999.80
30/06/2016	NOSH 247 LIMITED Contactless Card Purchase ON 29 JUN CLP		-£0.10	£1,999.90

Fig. 15: 7 Entries on statement for Visa card ending 9034.

The installation after LambEx was concluded on a Commercial basis in Cootamundra in November 2016 using the first commissioned vending unit in Australia. Fig. 14 presents an image of the installation at Sutton Street Store and the transactions on Day 1 on 25th November 2016.

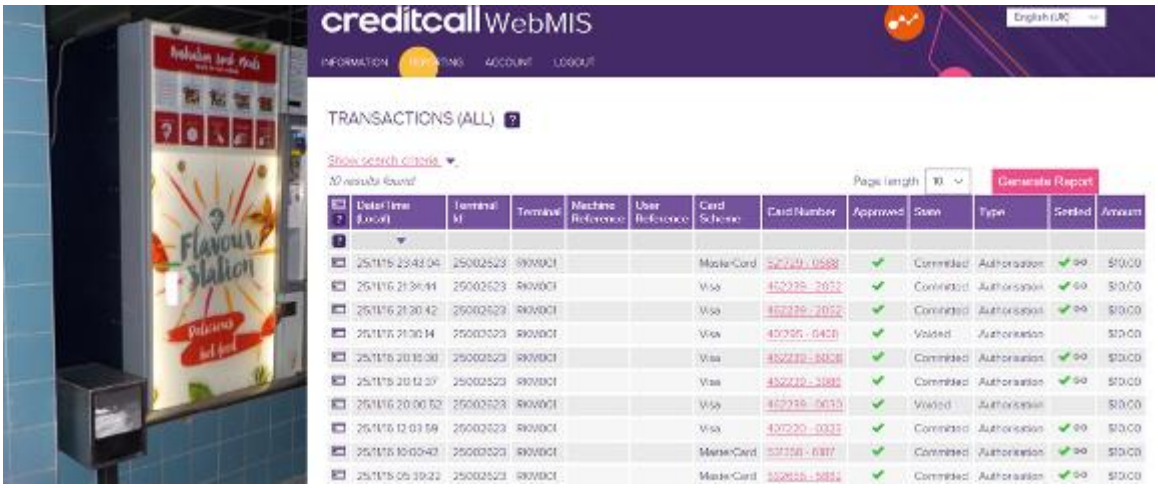


Fig. 16: Transactions on First day of Commercial Pilot in Cootamundra

3.9 Consumer responses

The feedback from all who have used a machine or viewed at FoodExpo, Brussels, IFFA in Frankfurt, and LambEx in Albury, Australia has been one of amazement, enthusiasm and positive reaction towards both the idea and the meals.

To date over one thousand people from the food industry as well as the general public have been introduced to the concept and the meals. The most recent has been at Cootamundra, in collaboration with Sutton Street Store, which also offers a take away service.

3.9.1 Reactions and preferences

The reaction to Lamb Meatball meals over the period of the project has been very positive and the project has now achieved an accredited supply chain both in Australia and in Belgium for the assembly of the meatball meals:

a) Massaman curry with rice
b) Tamarind lime peppercorn with rice
c) Tagine with Couscous
d) Napoli with spirelli pasta

Shelf life in Belgium, with possibility to supply the whole Europe and USA is 60 days from packing in Micvac. In Australia, this is 30 days in Simple Step packaging.

The reactions from simulated sales has been that all the meals are considered high quality and given the range, they are appealing to a wide range of consumers. Further details of purchase patterns will be included in the final report. Note that meal pricing at AU$ 10-12 is considered reasonable to date. There is also indications of demand for other meals such as Persian or Thai as well as range of other meals, with Australian meat.

3.9.2 Vending and meal supply

A significant part of the plan to reach locations and markets is the ability to supply installations. The project not only established the basis for meatball supply chain, but also the arrangements for supplying machines that can be supplied and sustainably supported in this new process of food service.

Leasing options are also available for commercial installations to be established during the follow Adaption project.

Legal procedures with contract documents, including Franchising options both for the assembly of meals and vending machines installations may be developed.

3.9.3 Locations and meal variety

A most revealing aspect of the project is the process by which locations are identified and contracted. Although, locations in Australia, Holland and UK have been identified, the opportunity requires arrangement that are more focused and persistent in order to increase the number of installations from the few to the 160 (16 x 10 vending machine clusters). Discussions with Hotels, Airports, Takeaway outlets, Offices and Hospitals have been initiated and will continue. Further pilot installations of vending machines for commercial sales are planned, under a new adoption initiative. The expansion of the meals range is under exploration including a wider range of meals that would use lamb and beef. Farmer branded meals (from the farm to the mouth), but retailing hot through a vending system is another complementary activity that has been prompted as a result of LambEx.

4. Conclusions and recommendations

During the execution of the project the following has been achieved:

- Product specifications of 4 meals.
- Pack design for vending.
- Production of a batch process to produce lamb meatballs.
- Production of meals for vending trials.
- Set up of a cooking facility for batch production of meatballs (20Kgs/hour).
- Definition of process flow from fresh lamb to cooked frozen meatballs and then their assembly into ready meals.
- Specifications for vending machine and payment systems.
- Establishment of electronic sales data and payment solution.
- First Domestic trial in a secure location.
- Identification of location for merchandising.
- Establishment of links with meals producers and parties to facilitate export.
- The supply operation for market trials established for vending machines.
- Sites in Australia, UAE, Belgium, UK and Holland have been identified as well as in Spain, USA and South America, but the unavailability of licensed cooked plants in Australia remains a complication with respect to expansion of the concept and the export opportunity.
- Electronic payment systems have been established including funds transfer agreements internationally.
- Meatball supply has been established and meal preparation process in Australia, Europe including UK and UAE has been arranged and tested.
- Pre-delivery and Post-delivery trials with vending machines and consumer acceptance trials have been conducted and customer feedback documented in this report as very positive.
- Consumer attitudes towards the meals has been positive and further feedback documented.

It is important to state that the system was demonstrated to the many thousands visiting Food Expo in Brussels and IFFA in Frankfurt Germany, including MLA representatives and the Australian processors on European Tour.

Further range of meals have also been developed and presented to Chef Sam Burke and the MLA in Brussels.

Location trails at exhibitions have been conducted. The key findings were:

- Lamb meatball recipe meals developed by the project are well received and everyone exposed to it at major trial run locations both in Europe and Australia considers a pricing level A$10-12 as reasonable.
- Telemetry has been established and tested for a branded vending solution as an output of the project in the form of Flavour Station.
- Consolidation of credit card transaction has been achieved.
- The supply chain process of meals has been established for the meatball recipes and validated, with formal nutrition, labelling and microbial documentation for commercial sale. The supply chain for Australia is ready for Adoption under initial supply agreements.

- The supply of meals in Europe is established, awaiting EU export license for an Australian facility producing meatballs.
- A first commercial Pilot has been reached in Cootamundra, which will be followed by others.

Meals supply models have been considered and details of the models together with the process of distribution and cost models as well as business models.
Locations for the install follow up commercial outlets are being explored. Further results for the final report in the form of sales data, operating experiences as well as consumer information would result from installations at these locations under a new Adoption project, being proposed to the MLA given the findings of the CBA as in ANNEXE 1, summarised by Greenleaf as follows:

- Previous cost benefit analysis and business case risk assessment of producing and supplying meals directly to end consumer, through a vending process has been reassesses against two models,
- Whilst the overall new product value is estimated to be $52,075,545, there are still considerable risks and barriers for both models. In taking the concept forward, there are several key considerations and recommended actions, including:
    - Requirement for export license for EU value added products or alternative export markets with ready access such as Asian countries
- Business model innovation that considers how down-stream parts of the supply chain can:
    - Increase connection and faster response to the end consumer needs
    - Align to the Australian supply chain to minimise competition from cheaper commodity raw materials.

Frew Group and BMC intend to proceed with an Adoption proposal under PIP, starting early 2018 to install and operate up to 10machines in Clusters of 3-5, within Australia to prove the business model with a range of meat meals, to be considered or developed in association with the MLA.

APPENDIX A – Food safe
http://www.foodauthority.nsw.gov.au/retail/cafes-restaurants-and-retail-outlets

HEALTH AND HYGIENE REQUIREMENTS OF FOOD HANDLERS

A food handler is anyone who works in a food business and handles food, or surfaces that are likely to come into contact with food (e.g. cutlery, plates). A food handler may be involved in food preparation, production, cooking, display, packing, storage or service.

Responsibilities of food handlers

Under the Food Standards Code, a food handler must take all reasonable measures not to handle food or food surfaces in a way that is likely to compromise the safety and suitability of food.

Food handlers also have specific responsibilities relating to health and hygiene.

Health requirements

Any food handler with symptoms or a diagnosis of an illness (such as vomiting, diarrhoea or fever) must:

- report that they are ill to their employer or supervisor
- not handle food if there is a reasonable likelihood of food contamination as a result of the illness
- if continuing to engage in other work on the food premises, take all practicable measures to prevent food from being contaminated
- notify a supervisor if they know or suspect they may have contaminated food.

Effective hand washing

Hand washing is one of the most important actions you can take to prevent foodborne illness.

Food handlers must:

- wash their hands using hot, soapy water and dry them thoroughly with single-use paper towels
- wash their hands whenever they are likely to be a source of contamination (after using the toilet, smoking, coughing, sneezing, using a handkerchief, eating, drinking or touching the hair, scalp or body)
- wash their hands before handling ready-to-eat food and after handling raw food.

Hygiene requirements

Food handlers must:

- not eat, sneeze, blow, cough, spit or smoke around food or food surfaces
- take all practicable measures to prevent unnecessary contact with ready-to-eat food
- Tie back long hair, and take all practical measures to prevent hair contaminating food
- ensure clothing is clean
- cover bandages and dressings on exposed parts of the body with a waterproof covering
- remove loose jewellery and avoid wearing jewellery on hands and wrists.

Use of gloves

The Food Standards Code does not require food handlers to use gloves.

NSW GOVERNMENT | Department of Primary Industries Food Authority

More resources at foodauthority.nsw.gov.au nswfoodauthority nswfoodauth

Even when wearing gloves, in many situations it may be preferable to use utensils such as tongs or spoons.

Gloves must be removed, discarded and replaced with a new pair in the below circumstances:

- before handling food
- before handling ready-to-eat food and after handling raw food
- after using the toilet, smoking, coughing, sneezing, using a handkerchief, eating, drinking or touching the hair, scalp or body.

Employer responsibilities

A food business must:

- ensure food handlers do not handle food if there is a possibility of contamination
- maintain easily accessible handwashing facilities and supplies of hot running water, soap and single-use paper towels
- ensure all food handlers have appropriate skills and knowledge in food safety and food hygiene. This can be done either on-the-job or via formal training.

Food Safety Supervisor

Under the Food Standards Code (Standard 3.2.2) all food handlers must have general skills and knowledge in food safety and hygiene. In April 2010, a law came into effect that required certain businesses in the hospitality and retail food service sector to appoint at least one trained Food Safety Supervisor (FSS).

Training is tied to nationally recognised units of competency that exist within the Vocational Education and Training (VET) System.

To review the Food Authority's Food Safety Supervisor initiative, including training requirements, visit www.foodauthority.nsw.gov.au/retail/fss-food-safety-supervisors

More information

- visit the website at www.foodauthority.nsw.gov.au
- Phone the helpline on 1300 552 406

About the NSW Food Authority: The NSW Food Authority is the government organisation that helps ensure NSW food is safe and correctly labelled. It works with consumers, industry and other government organisations to minimise food poisoning by providing information about and regulating the safe production, storage, transport, promotion and preparation of food.

Note: This information is a general summary and cannot cover all situations. Food businesses are required to comply with all of the provisions of the Food Standards Code and the *Food Act 2003* (NSW).

NSW GOVERNMENT | Department of Primary Industries Food Authority

6 Avenue of the Americas, Newington NSW 2127
PO Box 6682, Silverwater NSW 1811
T 1300 552 406
contact@foodauthority.nsw.gov.au
ABN 47 080 404 416
More resources at foodauthority.nsw.gov.au nswfoodauthority nswfoodauth

August 2015
NSW/FA/FI041/1508

APPENDIX B - Vending machines in use and being launched

Vending hot ready meals from frozen products

By Rick Pendrous+
04-Mar-2016
Last updated on 04-Mar-2016 at 09:31 GMT
3 comments

Ooft vending machines will heat frozen ready meals

Related tags: Ooft, SmartSCreen, Vending, Frozen, Chilled, Ambient, Bidvest Foodservice

A new vending machine, which produces hot meals from frozen products, will be launched on to the market over the next two months, according to the ceo of Bidvest Foodservice, the company behind the innovation.

Hot food vending machines have been available from a range of suppliers, such as Italian company Bicom, plus the likes of Hallmark Vending and Revive in the UK, for a number of years. However, while they are popular in countries such as Italy, Asia and the US, they haven't really caught on in the same way so far in the UK.

But Bidvest Foodservice's ceo Andrew Selley hopes the SmartScreen technology incorporated in his company's vending machines could change that by encouraging visitors to the nation's hospitals, train stations, hotels and music festivals to try out a different way of consuming hot and frozen food and drink.

Bidvest Foodservice in the UK, which is owned by South African international services, trading and distribution parent company Bidvest, employs around 4,500 people and operates from 25 locations across Britain.

SmartScreen innovation

Working in conjunction with a Brighton-based developer of SmartScreens, Bivest Foodservice has developed a vending machine called Ooft, a development of its SmartStore vending machine, which features innovative consumer interfacing technology.

It will be capable of heating 15 ambient ready meals in just two minutes, as well as dispensing other ambient, chilled and frozen foods, including desserts such as ice cream.

Speaking at the British Frozen Food Federation's annual conference last Tuesday (March 1), Selley described his company's approach to innovation. Bivest Foodservice markets a range of four own-brand products: 'Everyday Favourites', 'Premium Selection' and 'Farmstead' and 'Essential supplies', which covers non-food items.

http://www.nostrum.eu/en/

nostrum

Nostrum has currently more than 100 stores in Spain and Andorra.

Our stores are situated in excellent locations, in very busy streets.

They are designed with two different areas: the entrance of the store where you can our showcases with our products, and the dining area, an open space at the back of the store with tables and chairs where customers can eat our dishes.

Photograph of the first Nostrum store, on the Roger de Lluria street 134b, Barcelona.

42 Enterprise

powered by BRW.com.au

Meal delivery pioneer's next move

Food Healthy meals to be sold from vending machines for $10 each.

Michael Bailey

Bianca Monley's machines will provide vacuum-sealed dishes. PHOTO: DANIEL MUNOZ

Bianca Monley pioneered the healthy meal delivery market 14 years ago with Eat Fit Food, now she plans to spend more than $1 million on vending machines as a way of staying ahead of it.

The first of the 50 German-made machines Monley wants to place in offices over the next year are being trialled at Eat Fit Food's Sydney headquarters, where 2000 dietitian-designed meals a day are delivered fresh to subscribers in the inner suburbs (a Melbourne kitchen prepares 1000 more).

The meals intended for the office vending machines will be drawn from Eat Fit Food's current range of more than 600, with dishes like chicken lasagne, chilli con carne, pad thai and brown rice salad included in the trials. The meals are vacuum-sealed to give a shelf life up to three days inside the machines, where they are refrigerated until selected from an internet-enabled screen at the front. Once the worker taps their credit card – unless the machine has been set up by their employer to provide free meals – the food is automatically heated and vended complete with knife and fork within 70 seconds.

"This is all about providing a healthy option to a broader range of customers," says Monley. While Eat Fit Food's daily-delivered meal plans start at $185 a week, the meals from the company's vending machines will be $10 each. "We want them in high-traffic areas where people have minimal food options, and end up having chocolate bars and Cokes all day because they're too busy to leave the office."

Businesses that are required by law to feed staff working overtime could install the machines as a cost-saving compared to keeping kitchens open, Monley says, adding that two corporates have already agreed to host them. With the home delivery of complete meals or recipe kits now a heavily competed business, Monley says she has always reinvested cash flow to innovate.

Two years ago, she bought 40 hectares of scrubland in the NSW Southern Highlands which she converted into a farm, with "weekend help" from her partner Timothy Waugh, the marketing manager at Star Casino's Marquee nightclub. The farm now supplies a growing proportion of Eat Fit Food's fresh produce.

The vending machine investment will allow Eat Fit Food to scale nationally more quickly than with its meal delivery business alone, Monley says.

"The machines hold 100 meals each, so even if there's only one in an office block that's a lot less labour-intensive than what we're otherwise doing, where a standard client will have five meals in the bag we deliver to their door."

Monley has bootstrapped since launching her business in 2002, and didn't make a profit until 2012.

Monley was on International Women's Day named winner of the Veuve Clicquot New Generation Award. In the spirit of Madame Clicquot Ponsardin, who revolutionised champagne production upon inheriting her late husband's wine business in 1805 aged 27, the award recognises innovative female entrepreneurs aged under 40.

Monley pipped Sykerunner founder Julie Stevanja, as well as Bridget Loudon and Emily Yue, whose Expert360 consultant marketplace is about to open a Manhattan office.

APPENDIX C – CPI payment system

International Vending

Crane Payment Innovations (CPI) features the most comprehensive portfolio of Vending payment systems offering the fastest and most secure coin or bill handling as well as a state of the art cashless and telemetry systems that make your table top or freestanding vending machine more profitable.

MEI®, NRI® and CashCode® are the brands currently available in the EMEA Vending Market and all of our products are designed and developed with one objective in mind: to make you more money!

CPI is at the forefront of new technologies and our payment solutions are designed to the highest standards, and are known for being highly reliable and innovative. The new combined portfolio includes the CashFlow® 8000 coin mechanism range, the NRI v² colibri and v² eagle coin acceptors, as well as the Cashflow® 2000 and the MSMv2 bill validators, both market leaders for their high performance rates and reliability.

CPI also offers innovative solutions for both closed and public site cashless. CashFlow® mei-pay offers the benefit of both cash and cashless payment options available at a single POS in closed site locations.

The all new CashFlow® 5in1 eCash series can be fully integrated in your existing field base and the bezels can accept up to 5 different types of payments: notes, chip and/or magstripe cards, contactless cards and NFC technology.

In this section you'll find all the products available for Vending, but if you don't see what you are looking for, or need a more specialized solution, don't hesitate to contact us.

Filter International Vending Products

Show All International Vending | Bill Validators | Bill Recyclers | Coin Changer & Recycler | Coin Hopper & Dispenser | Coin Validator & Sorter | Software | Audit & Cash Management

Products

MEI CX Bill Validator
more

MSM BackLoad Bill Validator

MEI CASHFLOW® 5in1 eCash

APPENDIX D – Questionnaire

Australian Lamb Meatballs

Tick or cross one box per question please

Which meal did you have?

☐ Napoli (A) ☐ Massaman Curry (B) ☐ Tamarind Lime Peppercorn (C) ☐ Tajine (D)

How easy was it to use the machine?

☐ Very Hard ☐ Hard ☐ Average ☐ Easy ☐ Very Easy

What would you say about the temperature of the meals?

☐ Way Too Cold ☐ Too Cold ☐ Just right ☐ Too Hot ☐ Way Too Hot

How do you feel about the waiting time to receive your meal?

☐ Very Quick ☐ Quick ☐ Not bad ☐ Too long ☐ Way too long

How satisfied were you with your meal?

☐ Not at all satisfied ☐ Not satisfied ☐ Somewhat satisfied ☐ Satisfied ☐ Very satisfied

To what extent was your meal value for money?

☐ Very good value ☐ Good value ☐ Reasonable value ☐ Expensive ☐ Very expensive

Would you buy from the machine again?

☐ No ☐ Yes occasionally ☐ Yes Regularly weekly ☐ Yes often 2-3 times/week ☐ Yes everyday

Place sticker here

Any other comments or suggestions.

Thank you

Name: date:

APPENDIX E – Locations

- Hospitals, large schools/colleges
- Airports
- Train or bus stations
- Service stations (Motorway services; petrol stations)
- Theme parks and leisure centres
- University sites
- Company canteens, office complexes
- Shopping centres
- Main high streets
- Sports complexes, stadiums
- Zoos, cinema complexes
- Sea side resorts, Hotels
- Exhibition centres, local market

Supply chain and vending machines locations

The locations in Stawell at Frewstal will be supplied meeting the exacting needs of the consumers at this location.

The following is also in the planning:

- Melbourne (location near Southern Cross)
- UAE (Location near a local Producer)
- Belgium with Food Partners
- USA (with a food manufacturer to be identified – or direct sale of meals from a meals producer outside the USA)
- NSW (in with established Producers)

A minimum of 5 machines will be trialled potentially increasing to 10 depending on success.

Plans and measure of success

The plan will be as follows:

April 2016: Initial trial in Belgium at Food Exhibition (followed by Office location).

May 2016: Location in Melbourne (Holiday Makers)

June 2016: USA location in Atlanta (students-office workers)

July 2016: UK (supplied by Food Partners) – Universities, general public, etc.

August 2015: NSW (location to be decided)

It is potentially possible to increase the number of machines at each location to reduce the waiting time if sales levels are constrained by the cooking times.

The customer range includes holiday makers, students, office workers and potentially the general public at different locations.

It is expected that between 60-80 meals would be sold per machine per week initially. Based on location promotions, this is anticipated to double in the steady state to be reached by the end of 2015. The price is to yield AU$2.00 minimum per meal as net return. Pricing is to be at AU$ 9.00 initially.

The success is to be based on the reassessment of the value proposition and independent CBA by Greenleaf in respect of the business model from Stage 1.

ANNEXE 1: CBA by Greenleaf

Milestone 3B Report

Project Code:	P.PIP.0501 (Milestone 3B Report)
Prepared by:	K. Fanning, K. Bryan, P. Green, T. Swanepoel Greenleaf Enterprises Pty Ltd
Date published:	June 2017
PUBLISHED BY Frew Group	

Frews lamb meat in cooked meals for direct sale (stage 2)

1

Executive Summary

This project was a follow up to previous cost benefit analysis and business case risk assessment of producing and supplying meals directly to end consumer, through a vending process.

The objectives were to:

1. Evaluate two models,
    a) Partnering with meals producer local to the vending machines
    b) Meals directly exported from Australia.
2. Define lessons learnt and test assumptions and risk mitigation considerations highlighted in stage 1.

Whilst the overall new product value is estimated to be $52,075,545, there are still considerable risks and barriers for both models. In taking the concept forward, there are several key considerations and recommended actions, including:

- Requirement for export license for EU value added products or alternative export markets with ready access such as Asian countries
- Business model innovation that considers how down-stream parts of the supply chain can:
    - Increase connection and faster response to the end consumer needs
    - Align to the Australian supply chain to minimise competition from cheaper commodity raw materials.

Contents

1 Background

The Frew Group has a wide range of experience in meat based food production including procurement and processing of lamb, as well as production of retail ready meat products and value-added meats. A natural extension of this mix of capabilities is the development of a range of fully cooked prepared meals for export. A previous project[1] focussed on the business case for recovering meat and utilising it in meals that are sold directly to the end consumer through a hot food channel.

The purpose of this report was to review the previous cost benefit analysis[2] in regards to the work that had been completed in P.PIP.0501 milestones 1-3A[3].

2 Objectives

The objectives of this project were to:

1. Evaluate two models,
   c) Partnering with meals producer local to the vending machines
   d) Meals directly exported from Australia.
2. Define lessons learnt and test assumptions and risk mitigation considerations highlighted in stage 1[1].

3 Methodology

Data sources and cost benefit model from P.PIP.0461[2] was utilised with consideration to milestone reports[3] from P.PIP.0501. In particular, the two models of a) partnering with meal producer vs b) exporting meals from Australia, were analysed based on Table 1, Table 2 and Table 3.

Table 1: Supply Chain decision tree

S/C Decision Tree				
Decision Tree	**Lamb Meat Recovery**	**Meat Preparation and Cooking**	**Production, Packaging, Export**	**Meal Sales & Distribution**
Tree 1	Frew Group	Frew Group	Frew Group	Frew Group
Tree 2	Frew Group	Frew Group	Frew Group	Outside party
Tree 3	Frew Group	Frew Group	Outside party	Outside party
Tree 4	Frew Group	Outside party	Outside party	Outside party

[1] P.PIP.0461 - Lamb meat in cooked meals for direct sale. Completed 2015.
[2] P.PIP.0461 – Lamb meat in cooked meals for direct sale. Milestone 5 report. Greenleaf Enterprises, 2015.
[3] P.PIP.0501 – Milestone 2 Report, Milestone 3A report, Presentation-updated on Milestone 4. BMC and Frew Group, 2016-2017.

Table 2: Net present value along the supply chain

	Unit	Lamb Meat Recovery	Meat Preparation & Cooking	Production, Packaging, Export	Meal Distribution & Sales
Cost of production	$/kg	$ 4.82	$ 8.83	$ 31.01	$ 72.77
Margin	$/kg	$ 0.00	$ 1.17	$ 11.40	$ 7.49
Margin %	%	0.10%	13.22%	36.75%	10.29%
Sales Price	$/kg	$ 4.83	$ 10.00	$ 42.41	$ 80.25
Net present value	$	$ 12,678	$ 2,106,443	$ 30,150,227	$ 19,806,198
Capital cost	$	$ -	$ 982,240	$ -	$ -

Table 3: Supply confidence levels

An innovation assessment criteria (6.2) was also used to rate the current project on its desirability, viability and feasibility.

4 Results and Discussion

4.1 Pertinent information from the project so far

- The meat mix has been successfully blended, frozen, defrosted and utilised for making meatballs.
- Meals have been prepared, distributed and successfully vended, both in Australia and Europe. This has included the ability of the system to charge international credit cards.
  - Shelf life from packing in Micvac in Belgium is 60 days
  - Shelf life from packaging in Simple Step in Australia is 30 days
  - Meal pricing ~AU$12/meal.
- Consumer feedback has been positive on the quality of the meal and vending process.

4.2 Opportunities, barriers and risks of the two models

The net present value is estimated to be $52,075,545 (Table 2).

In supplying the Europe Union an export license for value added products would be required. The Frew Group do not have this license and it is uncertain if there are any other suitably located secondary processors in Australia who have the license. The costs and requirements in acquiring and maintaining certification for this licence would be a major barrier.

Clarification of tariff rates for relevant export markets, for raw and value added product, are required.

4.2.1 Partnering with meals producer local to the vending machines

A major barrier is the effort and time involved in developing suitable relationship with meals producer(s) in Europe.

However if a commercial relationship can be developed with a suitable meals producer, then this would reduce the risk regarding meal production and packaging (Table 3). It would probably also reduce risk for distribution of the meals through leverage of meal producer's distribution knowledge and contacts. This would be lower risk relative to producing meals in Australia for direct export.

A further important consideration for supplying meat balls to an European based meals producer is competition. If the Australian meat ball supplier is simply a raw material supplier without any point of difference (meat balls aren't difficult to make), will the meat balls be competitive with product that could be sourced from many other lower-cost suppliers? If a suitable meals producer is found then suitable legal contracts would need to be developed to ensure that the meal producer is committed to utilising Australian meat balls.

4.2.2 Meals directly exported from Australia

This model has higher risk than partnering with European meal producer. The production and export of meals, as well as the sales and distribution of the meals, are all unfamiliar processes (Table 3). Although work undertaken has resolved risk (4.1), a clearer articulation of the business model is required.

4.3 Consideration relative to innovation assessment criteria

The current project scores high for desirability (4.5/5) and feasibility (3.7/5) but lower for viability (1.7/5). The reason for this is the lack of clear buy-in by commercial players in Australia and in export markets.

5 Key Findings and Recommendations

There has been good progress in validating the concept of delivering a suitable quality lamb meat ball-based meal through vending machines. However there still appears to be significant risk, identified in previous CBA[4], which hasn't been completely addressed. Areas of suggested consideration and focus include:

1. Requirement for export license for European Union value added products or alternative export markets with ready access such as Asian countries.
2. Business model innovation that considers how down-stream parts of the supply chain can:
    - Increase connection and faster response to the end consumer needs
    - Align to the Australian supply chain to minimise competition from cheaper commodity raw materials.
3. A New Product Development process for the Frew Group (to improve success rate and minimise risk) to respond to "direct to consumer" recipe demands.
4. Detailed list of specific activities to further minimise the major areas of risk concerning unfamiliar aspects of meal production, export, sales and distribution.

[4] P.PIP.0461 – Lamb meat in cooked meals for direct sale. Milestone 5 report. Greenleaf Enterprises, 2015.

6 Appendices

6.1 List of Tables

6.2 Innovation assessment criteria

Table 4: Innovation assessment criteria

Assessment criteria	Highly Relevant	Minor non-strategic changes required	Moderate Potential with some strategic direction required	Significant work required	Irrelevant
Score	5 / 5	4/ 5	3 / 5	1 / 5	-
Desirability ***Do they want this?***	Prescribed is a product / service that is highly desirable (at least for targeted early adopter able and willing to change)	Slight consideration required to challenge whether this solves a solution, fits into people's lives, appeals to the end consumer, and that they actually want the product/service.	Major gaps in identifying one, or slight gaps in several of the following: whether this solves a solution, fits into people's lives, appeals to the end consumer, and that they actually want the product/service.	Major gaps in identifying one or more of the following: whether this solves a solution, fits into people's lives, appeals to the end consumer, and that they actually want the product/service.	No consideration to the desirability of the product for any captive audience or consumer, regardless of willingness to change.
Design of the product	The product/service is well designed with a clear value proposition (product – market fit)	DLI methodology required to better identify value proposition	Some misalignment between product solution and market fit. DLI methodology required to clearly articulate value proposition.	Major misalignment between value proposition and product design.	No link between value proposition and product design. Value proposition does not exist.
Need/solution the product fits	The product/service clearly outlines how it will solve an existing consumer problem	Minor gaps exist in solution provided. Needs analysis required to identify how the product/service solves an existing or anticipated problem.	An understanding of gaps and solutions the product/service fills is lacking. Capability to complete these supporting activities lacking.	Major gaps, or significant misunderstanding of how the product/service will solve existing consumer problems.	No understanding of how the product/service will solve the consumer problem. Focus is heavily technically oriented.
Market the product will serve	The product/service has a captive market destination and size of market is attractive	Minor gaps exist in the market analysis, including size of the market and consumer insights.	Market analysis and consumer insights need to be completed.	Significant market analysis and consumer insights are lacking.	No market analysis or consumer insights exist.
Viability ***Should we do this?***	The product/service is highly viable – created and captured value for stakeholders is well considered and represents 3 - 5 value multiplier to current offer	Further justification required to support reaching 3 - 5 value multiplier.	Commercial relevance of project needs to be translated via sound economic modelling.	Major gaps exist in supporting commercial viability. Consideration to 3-5 value multiplier needs to be given.	No information exists supporting commercial viability of the product or service.
Business Model	The product/service has a well-considered business model.	Minor gaps in the business model and alignment with design solution exists. Further work needs to be completed to prove economic feasibility.	Business goals are misaligned with design of the product/service. Sufficient planning and strategic intent to support effective execution are lacking.	Major strategic misalignment with product/service design. Only minor aspects of the business have been considered.	There is no plan for the successful operation of the business, identifying sources of revenue, the intended customer base, products, nor details of financing.

Business capability	The product/service includes appropriate and effective tools and elements to support commercial success	A gap analysis for the project required outlining what tools are needed to support commercial success.	A gap analysis for the project required outlining what tools and frameworks are needed to support commercial success.	Significant capabilities lacking to enable commercial success. External providers required to enable development in this area.	There are risks to no business capabilities to support commercial success.
Feasibility Can we do this?	The product/service is highly feasible	Minor input to resourcing and capability required to make this product/service feasible.	Significant work and resourcing required to make this product/service feasible.	With major intervention, the product/service may have a chance of being feasible.	The product/service is not feasible.
Architecture	The product/service has well considered architecture that supports its design features and contributes to the value proposition by iteratively testing assumptions through fast prototyping	The product/service requires minor changes to either its architecture, design features, contribution to the value proposition, or requires further testing of assumptions through fast prototyping	The product/service requires one or more changes to either its architecture, design features, contribution to the value proposition, or requires further testing of assumptions through fast prototyping	The product/service requires major changes to its architecture, design features, contribution to the value proposition, or requires further testing of assumptions through fast prototyping	No consideration given to the product or service's architecture, design features and contribution to the value proposition. No prototyping nor testing of assumptions exists.
Technology	The product/service efficiently uses new and existing technological solutions	The product/service needs to redefine the technological contribution to the value proposition.	Some consideration required for new or existing technologies to power the design solution	Significant consideration required for new or existing technologies to power the design solution	No consideration given to effective use of new or existing technological solutions