



# final report

## Blended Meat and plant protein product development-market testing (RTC Foods)

Project code: P.PSH.1237  
Prepared by: Todd Robertson  
RTC Foods  
Date published: 28 October 2020

PUBLISHED BY  
Meat and Livestock Australia Limited  
PO Box 1961  
NORTH SYDNEY NSW 2059

This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

**This publication is published by Meat & Livestock Australia Limited ABN 39 081 678 364 (MLA). Care is taken to ensure the accuracy of the information contained in this publication. However MLA cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests. Reproduction in whole or in part of this publication is prohibited without prior written consent of MLA.**

## **Abstract**

RTC Foods is a diverse food supply business, incorporating domestic and export meat supply of Australian red meat into Asia, the Pacific, Europe, the Middle East, and North America. In addition, RTC Foods Innovation, based on the Gold Coast, is tasked with looking at trends in the industry and investigating how we can develop products to take advantage of new markets.

The aim of this project was to deliver a case study identifying market feedback on blended meat concepts (hybrid plant and animal protein blends), including pain/gain points on the products, as well as consumer attitudes and taste preferences toward blended meat.

Considered in this study were blended burgers and meatballs with the inclusion of beef and lamb with a plant blend.

Unfortunately, due to COVID-19 restrictions on overseas travel, a need to pivot the project to focus on the domestic Australian market was undertaken. The initial intended value proposition(s) was to better understand how might a blended meat-plant protein product address consumers who are looking to reduce meat content or achieve a price point where they are looking for alternatives to an all meat solution and/or all plant protein solution. Further, an initial hypothesis was that a lamb variant blended with plant proteins might unlock different perceptions in markets where consumers typically are infrequent users of all-lamb products.

RTC remain confident that learnings from the domestic market nevertheless can help shape future strategies post COVID-19 to reconsider some of the initial value propositions assumed in countries such as the US, Canada, and Europe, particularly those markets where “plant-based meat” is becoming popular.

Overall, results from this project have shown a gap in the market between consumer wants and needs. Whilst some consumers desire to reduce their consumption of red meat, an option RTC Foods sees is that familiar products can continue to meet many of these consumers need with only a slight change in formulation to suit their needs, keeping red meat on the menu. If anything, RTC Foods found that replacing cereal binders with higher quality plant proteins and combining the good nutrients of red meat into a different proposition may represent a market niche. Again, this can complement rather than replace vegetarian or indeed all meat products and aligns with the flexitarian trend.

## Executive summary

The Australian red meat industry has a great reputation for quality both at home and abroad and continues to see strong sales throughout the world. For some however, there is, an increasing discourse around the negative impacts of the agricultural industry and the inclusion of red meat within a healthy diet. Campaigns by MLA such as “Australian Good Meat: doesn’t just happen” (<https://www.goodmeat.com.au/>) seeks to counter this with position with animal health and welfare, environmental, and health and nutrition facts. This project was undertaken to investigate what opportunity might exist for a blended red meat and plant protein product and feedback on several concepts are.

RTC Foods focus was to target the consumer who is thinking about reducing their consumption of red meat (but not completely exclude). The proposition was whether it is due to health concerns, cost or conscience related, a red meat and plant blend could be the answer – with an opportunity to call-out key attributes from the blended offer.

The blended offer bridges the gap between needing to lower red meat consumption but not wanting to abstain. Products evaluated were burgers and meatballs, blending beef and lamb with specialised plant proteins. The same taste and texture as an all-meat offer was desired, with the added benefits of a blended prototype including retaining protein levels while reducing saturated fat and introducing starches and fibre. As will be shown, the single most important issue to consumers is their health, and this has proven to be further evident amid the current COVID-19 pandemic.

COVID-19 restrictions severely hampered delivery of the project design with plans to travel interstate and overseas to research markets, perform interviews, and sample products impeded. However, an ability to pivot to desk-research and a focus shift from foodservice to retail has proven successful. RTC Foods have developed numerous red meat + plant protein samples and have collected feedback from a wide range of potential consumers, the results of which prove there is room in the market for a blended offering. Further, this represents a demand opportunity for red meat against trend for declining red meat consumption with some consumers.

In the last couple of years in particular, consumers have been inundated with negative messaging regarding red meat inclusion in a healthy diet. Yet on the other hand, people are also aware of the health benefits of red meat, causing a lot of confusion. Combine this with the fact that people love the taste and texture of red meat, it is what they prefer to eat!

RTC Foods believe a blended product gives consumers a choice that is an easy step to make, keeping Australian beef and lamb on the menu, and giving the industry further opportunity to expand their market share in underdeveloped markets.

Markets where the convenience of a prepared centre of plate is complemented with functional features like increased fibre and reduced saturated fat without compromising the taste and texture desired by meat eaters who are being advised to reduce meat intake to reflect a balanced diet.

At this stage, the red meat industry in Australia is strong. However, it is vital to examine the changing demands of consumers and markets around the world, as well as the development of alternative markets, and the affect this will have on the industry going forward. It is important the industry does not sit still while meat alternatives continue evolving around them, it must stay relevant and innovate to keep red meat on the menu.

## Table of contents

<b>Abstract .....</b>	<b>1</b>
<b>Executive summary .....</b>	<b>3</b>
<b>1. Background .....</b>	<b>5</b>
<b>2. Objectives.....</b>	<b>6</b>
<b>3. Methodology .....</b>	<b>7</b>
<b>3.1 Testing the Market.....</b>	<b>7</b>
<b>3.2 Specification .....</b>	<b>8</b>
3.2.1 Beef Patty 70/30 .....	8
3.2.2 Lamb Patty 70/30 .....	9
3.2.3 Beyond Meat – 100% Plant based Burger .....	10
<b>3.3 Research .....</b>	<b>10</b>
<b>4. Results.....</b>	<b>11</b>
<b>5. Discussion.....</b>	<b>14</b>
<b>5.1 New Products and sales forecasts .....</b>	<b>14</b>
<b>5.2 Nutrition .....</b>	<b>18</b>
<b>5.3 Launch .....</b>	<b>18</b>
<b>5.4 Export .....</b>	<b>18</b>
<b>6. Conclusions/ Recommendation .....</b>	<b>20</b>
<b>6.1 Conclusion .....</b>	<b>20</b>
<b>6.2 Recommendations .....</b>	<b>20</b>
<b>7. References.....</b>	<b>22</b>

## 1. Background

Many would say in the current market, 'Australia does not have any issues selling meat'. Demand for Australian beef and lamb is at an all-time high, and for some products it is a struggle to meet that demand. So why then are some 'meat' companies deciding to look at blending beef and lamb with plant protein? This project whilst not directly addressing this presents lessons learnt in developing a range of blended products with an Australian red meat call out.

RTC Foods is a meat company and since 1987 have been sourcing and selling meat all over the world. It came to their attention approximately 18 months ago that new start-up companies such as Beyond Meat and Impossible Foods were not only producing plant-based "meat", but actively increasing the negative rhetoric around red meat for their own benefit. In fact, Pat Brown, CEO of Impossible Foods, believes companies such as his "are going to completely replace the animal-based products in the food world within the next 15 years. That's our mission" (Clifford 2020, p.1). These companies, along with their celebrity investors, are using modern media channels to promote their causes and push their ideas, no matter how crazy they may seem.

Although changes in consumer's lifestyles are affecting how, when, and why they eat certain foods, red meat is certainly not the enemy. There has been a lot of activity in the alternate protein space, from cultured lab-grown meat, to plant proteins that better mimic natural meat textures and taste. Whilst there are several sustainability claims for and against, ultimately taste, texture, and price remain key purchase drivers (Lang 2019). There is also a rise in the number of markets where reducing meat content, as opposed to removing meat altogether for a full vegan diet, is occurring. From flexitarian diets to meat-free Mondays, to a meat and plant protein blended offer.

The media attention surrounding these companies and the agenda they are trying to push is leading some consumers to become increasingly confused regarding red meat consumption. They see the value of red meat as a good source of protein and energy for the family but are subjected to this negative messaging. These consumers are not searching for a vegan offering, instead, are interested in a blended product that can deliver the nutritional benefits they are looking for. RTC Foods therefore considered Australian red meat and plant protein blended products could give these progressive families the alternative they seek.

RTC Foods found that eating habits are ingrained at a young age through parents, and the more messaging those parents are seeing, the more confused they are becoming with what their children should and should not be eating (Kids in the kitchen n.d.). A balanced diet is the key to a healthy lifestyle, but this message is not getting any cut through from the negative media red meat is receiving from certain sectors. The problem, and the reason for this blended research, is that currently the red meat industry has limited rebuttal. RTC Foods can refute these claims, but need to do it with fact, not fiction, as in their case. By blending red meat with only 30% plant protein it will give the "modern" consumer exactly what they are looking for without them having to substitute, particularly when that substitute is a plant based "meat" which doesn't meet the nutritional requirements they seek (Gelsomin 2019).

Interestingly, large global meat companies such as Cargill and JBS are investing in plant-based protein (Sullivan 2020). One would suggest that this is an investment to sell more protein globally as they know with population increases demand is only going to get stronger for protein, regardless of where that comes from (Our Meatless Future 2020). Ultimately, the proposition RTC Food propose is that 'we do not have to replace red meat altogether; we can make it go further, and have it meet the needs of the modern consumer'.

## 2. Objectives

Plant-based “meat” is obviously a mega trend currently sweeping developed markets. These companies are riding a wave of media coverage, trying their best to become mainstream so they may scale up to reduce costs and try and become competitive with traditional meat products. Brands such as Beyond Meat and Impossible Foods are trying to increase their market share by targeting not only vegans or vegetarians, but consumers who are looking at their lifestyle thinking they could be doing a little better (Our Meatless Future 2020).

Whilst MLA’s own Good Meat messaging (see: [www.goodmeat.com.au](http://www.goodmeat.com.au)) will continue to support sustainability for Australian red meat, RTC Foods proposition for this project is that by blending red meat and plant protein it can significantly enhance the messaging and give those carnivores who are considering their health and environmental issues, an alternate solution. These consumers do not have to become vegan or vegetarian and consume plant-based meat, and they do not have to substitute red meat from their diet (Laurence 2019). At present there is not a product range available that offers the full taste and texture of red meat, whilst preserving the high protein levels and nutrition of red meat, that consumers crave.

RTC Foods have found by blending red meat with plant protein they can introduce more meat into the diets of those consumers who are being priced out of the market, both domestically and internationally. As well as those consumers who consider the strong taste of Australian beef and lamb a deterrent to consuming, which is well documented in markets such as Korea and Japan (MLA Market Snapshot 2019). Interestingly, research has also shown with blended products you can pick up market share for Australian red meat from female consumers who also dislike the strong taste and mouth feel of burgers, meatballs, and other similar products.

Australia’s Pacific neighbours Fiji, Samoa, and PNG were to form a large portion of research, however, this failed to materialise due to the COVID-19 restrictions around travel. Intentions were to visit these markets to investigate reducing cost and increasing the quality of meat they are purchasing. The Island nations have for a long time been a great customer of the Australian red meat industry, but now China’s protein consumption is higher than ever, and the Australian meat industry are rightly capitalising on it. RTC Foods felt they could do better for their Pacific Neighbours and thus keep Australian red meat on the dinner table for these loyal consumers. This objective will still be explored when restrictions ease, to ensure Australian producers are not reducing the quality of meat exports to meet price points demanded. RTC Foods will talk to relevant health experts in these countries and develop products that not only turn secondary cuts into more valued products at an affordable price, but also help these loyal customers keep red meat in their diets without reducing quality to do it.

There is no doubt that meat prices have increased and will likely keep increasing. Therefore, an objective is to make sure cost does not become a deterrent for developed countries as export markets continue to demand Australian meat. A large barrier for plant-based meats is that the price is not competitive, however, this could be short lived if meat prices continue to rise and economies of scale allow products like Beyond Meat and Impossible Foods prices to fall (Shapiro 2019).

The main objective for this project was to produce a meat product that competes with “modern plant-based meats”, and to dilute the anti-meat messaging. It gives those consumers looking to do better a red meat alternative, so they do not have to substitute, and also creates opportunities to build market share through reducing “meaty” flavours and creating a better mouth feel for consumers.

### 3. Methodology

Project design combined development of prototypes to test product costings, yields and sensory profiles. Market feedback via series of interviews were then conducted and compiled into a final report.

COVID-19 had a profound impact on RTC Foods ability to research markets that it had hoped to develop further, therefore, a pivot toward more desk and domestic primary research was applied. This did not affect results for developed meat markets as the desk research from export markets had very similar results to that found through domestic primary research.

RTC Foods first interview was conducted with a registered dietician and nutritionist in Australia, to get an understanding of the latest advice for consumers around diet and red meat consumption. Not surprisingly, moderation of red meat and increased vegetable consumption was the key advice, however, when pressed on red meat intake it was shown that a high fibre diet can reduce some negative association with eating too much red meat.

Numerous studies have shown that some functional components such as dietary fibre and antioxidants are deficient in red meat products. They do, however, contain a rich source of many essential nutrients including amino acids, iron, zinc, selenium, vitamin B12 and vitamin D (Ponnampalam et al. 2017). Hence, adding those functional components would help position red meat in a more positive light.

As a result of the first interview RTC Foods began looking into functional foods, and there were many examples available. You need only look at the beverage and dairy industries; yoghurts with probiotics and prebiotics, sports drinks with protein powder, heart plus milk, Omega plus milk, protein shakes, the list goes on. These products are expanding the market for the base product and adding health benefits the consumer values. The question then is - so could this be done with meat?

#### 3.1 Testing the Market

Initial trials were focused on blending meat protein and plant protein into a burger, this was due to the main plant-based companies using burgers to launch, therefore enabling us to achieve a direct nutritional comparison. Initially two burgers were produced: A Beef + Plant and a Lamb + Plant option, using a 70% meat protein and 30% plant protein mix.

It is important to note that the plant protein used is made specifically to blend with meat. It is not about simply replacing meat with vegetables, as is commonly the case, as this can affect taste and texture. Taste and texture are two of the three most important factors why carnivores are rejecting plant-based meat. In addition, the plant protein will not reduce overall protein levels like vegetables will, it simply replaces the meat protein. A main objective of this project was to ensure the protein levels remained the same as a 100% meat product (Protein – powered by a natural health halo 2019).

Trials were completed at Positive Proteins, a specialised burger manufacturer in Braeside, Melbourne.

Beef 85cl Chuck was used for the 70% meat protein, blended with 30% plant protein sourced from The Better Meat Co. This wheat-based protein was chosen as it is specifically formulated to mix with meat.

Initial trials were undertaken with a higher fibre protein to try and increase fibre levels, as this was identified during research as being of upmost importance. Initial feedback on these products were the higher fibre protein changed the consistency of the meat to a degree where it lost texture. This is an important point for the strategy and messaging as the product needs to look, feel, and taste like meat. Product texture has been one of the main pain points for consumers trying plant-based products, they just do not taste or have the mouth feel of meat, and therefore, using anything that reduces the mouthfeel quality will not work. To be sure of this feedback another sample of high fibre protein was imported for further trials, however these trials unfortunately produced the same results.

It was decided rather than reducing the quality and texture of the product they would revert back to the original protein, and research the importance of fibre for customers further before spending more time trying to increase these levels.

The foodservice beef burgers were a 70% beef 30% plant protein mix using the original plant protein.

The results of our first samples are below.

### 3.2 Specification

#### 3.2.1 Beef Patty 70/30

Raw material - beef chuck

CL of raw material 89.5% increased to 90% once blended

Raw weight of patty 150gms reducing to 120gm cooked

Feedback was patty was very mushy (using high fibre protein, since re-done with original plant protein)

	Quantity per serve	% Daily Intake	Quantity Per 100
Energy (Kj)	830KJ	10%	830KJ
Energy Cal	198 Cal		198 cal
Protein	21.4g	43%	21.4g
Fat – Total	12g	17%	12g
-saturated	4.8g		4.8g
Fibre	Less than 1g	3%	Less than 1g
Sodium	125mg	5%	125mg

Table 1: Nutritional panel for beef burger patty





Figure 1: Beef patty burger containing 70% beef and 30% plant protein mix.

### 3.2.2 Lamb Patty 70/30

Raw material – boneless lamb leg, shank off

CL of raw material 89.4% when blended 90.4%

Raw weight of patty 150gm dropping to 127gm once cooked

Opinion that the lamb taste was pleasant and not of a mushy consistency like beef (produced using original plant protein)

	Quantity per serve	% Daily Intake	Quantity Per 100
Energy (Kj)	859KJ	10%	859KJ
Energy Cal	205 Cal		205 cal
Protein	24g	48%	24g
Fat – Total	11.4g	16%	11.4g
-saturated	5.0g		5.0g
Fibre	Less than 1g	3%	Less than 1g
Sodium	117mg	5%	117mg

Table 2: Nutritional Panel for Lamb burger patty



Figure 2: Lamb Patty burger containing 70% lamb meat protein and 30% plant protein mix.

### 3.2.3 Beyond Meat – 100% Plant based Burger

	Quantity per serve	% Daily Intake	Quantity Per 100
Energy (Kj)	1131KJ	13%	1131KJ
Energy Cal	270 Cal		270 cal
Protein	20g	40%	20g
Fat – Total	20g	19%	20g
-saturated	6.0g		6.0g
Fibre		12%	3g
Sodium	380mg	15%	380mg

Table 3: Nutritional panel for 100% plant based burger patty

In addition to Beyond Meat 2020 nutritive values was the following quote:

“By shifting from animal to plant-based meat, we can address four growing global issues: human health, climate change, constraints on natural resources, and animal welfare”. For the purpose of this report RTC Foods merely wishes to note this claim and makes no further comment.

## 3.3 Research

From this research we can draw conclusions that the blended 70/30 beef + plant or lamb + plant burgers are a relatively comparative product in the market for the meat reducer who is looking at healthy alternatives. Although results for fibre levels were not realized within this product, especially when compared to Beyond Meat, all other nutritional comparisons were improved, illustrating that the blended option at least compares to a plant-based product.

Although Beyond Meat lists ‘health’ on their website and in marketing as their number one concern (see [www. www.beyondmeat.com](http://www.beyondmeat.com)), the nutritional panel suggests otherwise, without even mentioning the ingredient list. Thus, confirming the theory that with large marketing budgets plant-

based burger companies such as Beyond are essentially using health as a weapon against the mass meat market. Although their goal is environmental impact reduction, according to Mark Lang of the University of Tampa, “contrary to industry research and press that prioritise the environment as one of the primary reasons why consumers are seeking meat alternatives, environmentally sustainable was ranked in the last two of eleven benefits” (Lang 2019, p.7). Therefore, supporting the hypothesis that consumers looking to reduce meat are doing so for health benefits, RTC Foods consider a blended product is one of the absolute healthiest alternatives on the market - which includes 70% meat!

A major factor when beginning this trial was that plant-based companies will need mainstream meat eaters to convert to their product to scale up and bring the price down. Paul Shapiro of The Better Meat Co. in Sacramento, a vegan and animal welfare proponent, knows this all too well. In 2019, Shapiro writes, “the entire plant-based meat sector makes up under one percent of meat sales right now” (Shapiro 2019, p.2). The plant-based meat manufacturers need the mainstream market, they need to market to the pain points of the current consumer to try and convert them to their 100% plant-based products. They are marketing health and may have had a slight advantage over current “all meat” products in the market, until now.

Although, in terms of nutrition, the product was comparable to the plant-based meat alternatives, it was felt that communicating this to the public through foodservice channels could be problematic. Brands and positioning messages can get lost through different outlets and the only real vehicle for messaging is social media alongside retail packaging. It was surmised that menus would not present the same vehicle for information as a packaged retail product.

As COVID-19 started to influence lockdowns and closures of foodservice establishments, it did make the decision easier to turn the focus towards working on retail lines.

Research showed early that consumers were being confused by conflicting messages around meat. Plant-based companies were getting a lot of press, at the same time, dieticians were advising consumers to reduce red meat. This was an obvious pain point for consumers as they looked for products to substitute (Neff et al. 2018).

RTC then invested heavily in research and development to market the benefits of red meat to consumers, with an emphasis on protein, saturated fat, and fibre. Consumers should not have to substitute red meat with white meat or plant-based meat when they now have an option. The philosophy being, if you want to reduce red meat, you do not have to give up red meat completely, an obvious pain point for meat reducers.

RTC Foods developed products that are already pre-cooked in a tray, to give the consumer extra convenience and get red meat into the relevant “modern meat” category. The product can simply be re-heated in the packaging in 5 minutes. All packaging material being recyclable alleviates environmental concerns, and nutritional aspects give the consumer exactly what they want without having to give up meat.

## **4. Results**

Online research shows most consumers looking to reduce meat are doing it for health reasons, cost, and environment, in that order (Neff et al. 2018). Only 12% of respondents in a US survey said that they reduced their consumption due to animal welfare, which supports the theory that people concerned with animal welfare will be more than likely non-meat eaters already. A point reflected in

RTC Foods’ research also, which showed nearly a third of people who said they wanted to reduce meat were doing it for health reasons, followed by environmental issues. This survey gave the respondent the ability to select multiple answers.

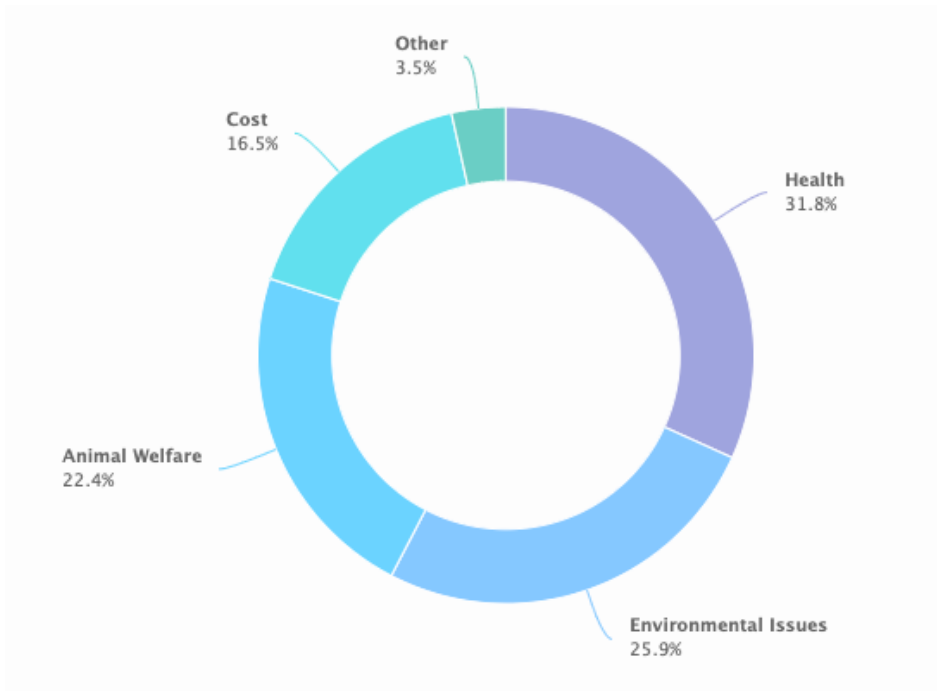


Figure 3: Reason for reducing meat

Interestingly, when respondents were asked if they would consider plant-based meat as a way of reducing their red meat intake, 76% of respondents said they would. However, notably only 16% considered it healthier and only 3.4% thought it would taste better.

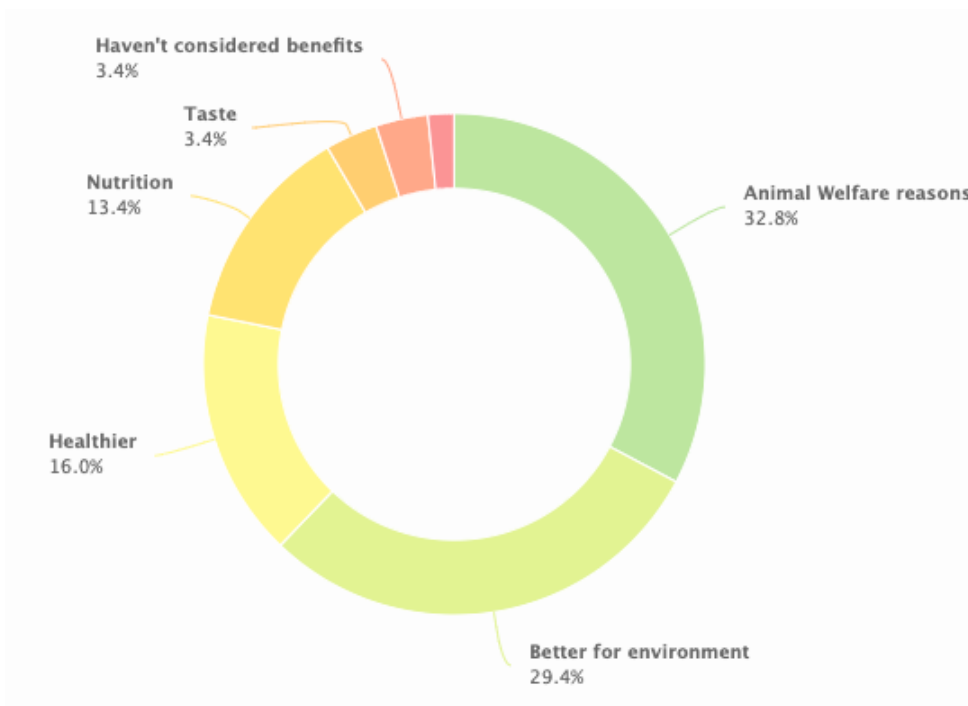


Figure 3.1: Would you consider plant based meat?

These results reveal the opportunity available to target the messaging coming from the plant-

based industry with RTC Foods' blended product. It is tastier, healthier, and cheaper. Respondents were asked to complete a statement about blended red meat and plant protein.

As shown below - would you consider a meat and plant-based blended product.....?

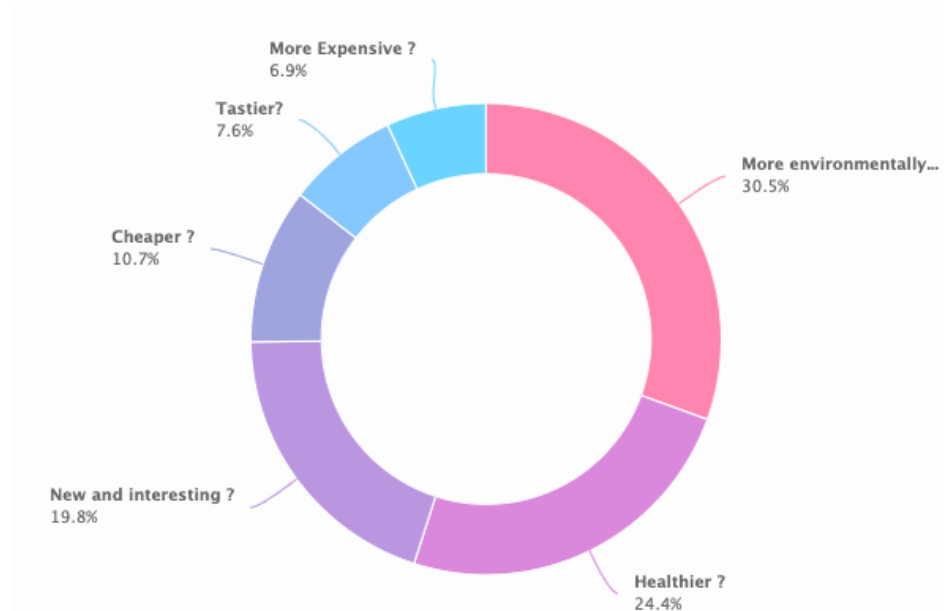


Figure 3.2: Perception of blended meat

The main point from this question is that 43% of respondents would view the product either healthier or new and interesting and 30% more environmentally friendly, added to this 7.6% tastier and we have 80% of respondents seeing positives in blended red meat. This is huge considering the marketing we are hearing from plant-based and certain sectors of the media is negative.

In taste testing of blended burgers prior to COVID-19, results showed a favourable response to texture and mouth feel, interestingly, in all our female respondents in particular. The conclusion is that the plant protein reduces the saturated fat in product and the overall “meaty” taste that some females and markets find too strong, particularly with lamb.

Other comments included “this would be good for my kids” and “I can’t even taste the protein” which was one of RTC Food’s assumptions at the beginning as a means of success.

RTC Foods deduce that marketing will need to target health and the environment, and at the same time, be at a price point which represents a premium but not out of reach for the mainstream consumer, as this will reduce the opportunity to trial.

In one European study, (Neff et al. 2018) it was discovered that 76% of meat reducers ate fish in meatless meals, 49% eggs, 34% cheese, and 26% imitation meats such as vegetarian burgers. This is interesting as it supports the identified pain point that if a consumer wants to reduce meat, they must drop it altogether. The theory with a blended product is, you are reducing meat, whilst keeping it on the menu. It is therefore RTC Food’s finding that a blended offer is a response to the plant-based rhetoric, with nutritional results recording a plant and beef blend still with 70% meat, at more healthy saturated fat levels than Beyond Meat and Impossible Burger.

## 5. Discussion

Impossible Foods believes ‘we are changing our diet and attitudes to eat healthier and more sustainable foods. Given the strong preferences among young people to eat this way, they are confident plant-based foods are poised for inevitable growth’ (Kids in the Kitchen 2019). Arguably, armed with their massive marketing budgets and growing list of celebrity influencers, plant-based brands will continue to get plenty of attention.

RTC Foods are looking at future generations and how these trends may affect the dietary habits of children in the future. Case in point are Millennials, a generation creating a new model for parenting, profoundly shaping generations after them. Their choices will obviously directly influence their children, and Millennial parents are now consuming more and more plant-based meat alternatives than ever before. With confusing messages coming from all media platforms it is not hard to see why this younger generation are seeking new alternative foods, for themselves and their children. Research has shown, through both surveys and interviews, that “kids” come up in conversation in an extremely high percentage of them. Parents are becoming increasingly concerned about what is “healthy” not only for them, but their children, as well as for the environment. Benson (2019, p.3) suggests “parents who are looking for ways to eat and serve less red meat, who want to make a positive environmental impact, will be natural influencers to kids”. Through blending it can give parents an option without eliminating red meat, and thus not excluding future generations from consuming red meat and its benefits.

Recently nutritional aspects of plant-based meats have been brought into question. Even John Mackey, a vegan, Founder and CEO of Wholefoods in the USA, is not sold on the health benefits of plant-based meats, “I don’t think eating highly processed foods is healthy” (Scipioni 2019, p.3). However, as Benson (2019, p.5) states, “the nutritional value of non-meat burgers might change for the better over time whereas meat will continue to be meat.” This last comment is extremely important. RTC Foods considers the meat industry needs to be innovative too, and a blended product shows that meat may not always be all meat. This project indicates that it is possible to develop and some say improve, and compete. The red meat industry cannot stand still as the plant-based revolution continues to improve, as it will eventually get to where it needs to be with price, texture, and taste. It cannot assume plant-based meats will always be more expensive, as meat prices continue to increase, plant-based meat prices will continue to decline.

It is impossible to deny consumers around the world consider environmental issues, and this study shows, overwhelmingly, consumers are looking at ways they can change purchase behaviours to have a positive impact. The philosophy from the beginning of this project was that it needs to be relevant to these global issues facing the industry. The meat industry needs to play in the market between consumers looking to eat healthier but not necessarily believing plant-based is healthier. RTC Foods note the work MLA is leading regarding Carbon Neutrality by 2030 (see: <https://www.mla.com.au/research-and-development/Environment-sustainability/carbon-neutral-2030-rd/cn30/>) however, the mainstream market is looking for alternatives that the meat industry currently does not have, as large industry players simply develop their own plant-based alternatives. Whether they are correct or not, RTC Foods believe this market will be looking more and more at moving away from meat completely as marketing from competing proteins continue to blur the facts on what is “healthy” and what is not.

### 5.1 New Products and sales forecasts

RTC Foods have developed two new products for launch within Australian retail that are projected to help reduce the impact of negative marketing against the red meat industry.

Beef + Plant Meatballs and Lamb + Plant meatballs are products that will be launched in the meat cabinet to compete directly with plant-based meat alternatives. The focus is the middle ground, being the best of both worlds, if consumers are thinking of reducing red meat they do not have to eliminate it altogether - there is an option.

RTC Foods are targeting the younger generation, in particular Gen Z and Millennials, as it is shown through research that these groups are the ones who are most likely to be influenced to try new products, and are interested in new foods. They are confused about the messaging they are receiving and think they should be doing better for their health and the environment. As they are ‘on the go’ the product is cooked in recyclable packaging to make it easier and more convenient.

The pack is designed to get attention, enticing consumers to pick up the product, read the benefits, and realise they can have red meat AND do better for themselves and the environment. Why eat 100% plant when you can have Beef + Plant and be healthier! is RTC Foods focus from the findings of this project.

NEW PRODUCT	PRODUCT NAME	SIZE/WEIGHT (g/ml)	ANIMAL PROTEIN DESCRIPTION	Product description	INGREDIENTS & BLEND FORMAT	weight animal protein/unit	raw protein cost / unit	cooked protein retail/ unit	Uplift value on protein	% increased value on raw protein	UNITS PER CUSTOMER PER WEEK	PROPOSED DISTRIBUTION (CUSTOMER)	ESTIMATED ANNUAL LIFT IN PROTEIN VALUE	UPLIFT VALUE year 1	UPLIFT VALUE year 2	kg raw wk	yearly usage /kg	MT		
2	Plus Plant	BEEF + PLANT MEATBALLS ZESTY TOMATO & BASIL SAUCE	600g	Grass Fed diced Beef chuck 90CL	2 SERV TRAY (600g) BEEF + PLANT MEATBALLS in ZESTY TOMATO & BASIL SAUCE	Cooked 70/30 Blend to include 2 servs Veg per unit	0.21	\$ 1.75	\$ 3.36	\$ 1.60	91%	20	150	\$ 4,813.20	\$ 250,286.40	\$ 500,572.80	630	32760	32.76	Beef
3	Plus Plant	LAMB + PLANT MEATBALLS FRESH & FIERY HARISSA SAUCE	600g	Boneless Lamb Leg Meat 90cl	2 SERV TRAY (600g) LAMB + PLANT MEATBALLS in FRESH & FIERY HARISSA SAUCE	Cooked 70/30 Blend to include 2 servs Veg per unit	0.21	\$ 2.31	\$ 3.36	\$ 1.05	45%	20	150	\$ 3,143.70	\$ 163,472.40	\$ 326,944.80	630	32760	32.76	Lamb
4	Plus Plant	Beef Burger	150grams	Grass Fed diced Beef chuck 90CL	150 gram Blended Beef burger	Raw frozen 70/30 Blend	0.105	\$ 0.88	\$ 2.24	\$ 1.37	156%	150	50	\$ 10,249.80	\$ 532,989.84	\$ 1,065,979.69	787.5	40950	40.95	Beef
5	Plus Plant	Lamb Burger	150grams	Boneless Lamb Leg Meat 90cl	151 gram Blended Lamb burger	Raw frozen 70/30 Blend	0.105	\$ 1.10	\$ 2.54	\$ 1.44	130%	75	50	\$ 5,389.45	\$ 280,251.56	\$ 560,503.13	393.8	20475	20.475	Lamb
														\$ 1,227,000.21	\$ 2,454,000.41					

Figure 4: forecast sales and raw to cooked value add contribution

Blended meatballs that taste great and are ALL GOOD.

GOOD Aussie Beef + GOOD Plant Protein.

**Beef + PLANT** MEATBALLS IN A ZESTY TOMATO & BASIL SAUCE

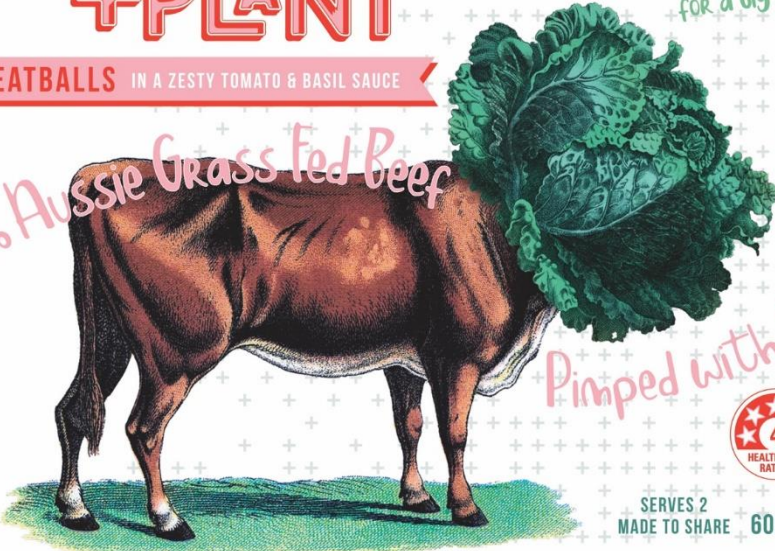
**Beef + PLANT**

MEATBALLS IN A ZESTY TOMATO & BASIL SAUCE

100% Aussie Grass Fed Beef

Pimped with Plants

A small change for a big impact.



HEALTH STAR RATING 4

SERVES 2  
MADE TO SHARE 600g

**Beef + PLANT**

TRY: *Chicken + PLANT*  
*Lamb + PLANT*

**MEATBALLS IN A ZESTY TOMATO & BASIL SAUCE**

Why eat 100% plant based, when you can eat Beef + Plant? We're giving you real beef meatballs that just happen to be pimped with plant protein. That means they're really, really good for you. And, it's kinda like hiding the veggies on the kids, but without compromising the protein hit. You're welcome!

**INGREDIENTS**

+PLANT BEEF MEATBALLS (50%) (BEEF MINCE (66%), PLANT PROTEIN (28%)) (CONTAINS WHEAT PROTEIN (WHEAT GLUTEN, WHEAT STARCH, COLOUR (CARAMEL, E150a)), SUNFLOWER OIL, MUSHROOM POWDER, ISOLATED PEA PRODUCT, LENTIL FLOUR, NATURAL FLAVOURS), RICE FLOUR, WHEAT FLOUR, WHEAT BRAN, SALT, MINERAL SALT (451, 450, 452), PAPRIKA OLEORESIN, HERB & SPICE EXTRACTS, CANOLA OIL), TOMATO AND BASIL SAUCE (50%) (TOMATO (42%) (PUREE AND PASTE (ACIDITY REGULATOR (CITRIC ACID))), WATER, ONION (14%), BASIL (3%), GARLIC CRUSHED, TAPIOCA FLOUR, SALT, YEAST EXTRACT AND THICKENER (XANTHAN GUM))

**CONTAINS: WHEAT, GLUTEN AND SOY PRODUCTS**

**NUTRITION INFORMATION**  
Serving size: 2. Serving size: 300 g

	Avg. Quantity per Serving	Avg. Quantity per 100 g
Energy	1320 kJ	440 kJ
Protein	30.9 g	10.3 g
Fat, Total	12.4 g	4.2 g
- Saturated Fat	4.5 g	1.5 g
- Trans Fat	0.3 g	0.1 g
- Monounsaturated Fat	7.5 g	2.5 g
- Polyunsaturated Fat	1.2 g	0.4 g
Carbohydrate	17.1 g	5.7 g
- Sugars	5.8 g	2.0 g
Dietary Fibre	4.0 g	1.3 g
Sodium	878 mg	292 mg

**STORAGE INSTRUCTIONS**  
Keep refrigerated at 0-4° C. Consume immediately after opening & cooking. Please dispose of packaging thoughtfully.


**WE'RE THE MIDDLE GROUND**

We're the best of both worlds, the having your cake and eating it too. We're the full beef experience, with added plant ingredients you won't even know are there. How good does that sound? As good as it tastes, friend... as good as it tastes!


100% GRASS FED AUSSIE BEEF  
GOOD SOURCE OF PROTEIN  
GOOD SOURCE OF DIETARY FIBRE  
LOW IN SATURATED FAT

**WHEN WE SAY WE CARE, WE MEAN IT:**  
Our trays are made from recycled, post-consumer material that can easily be recycled again and again. So, pop our tray and sleeve straight in the recycling.

**THE POSITIVELY GOOD CO.**  
Suite 300, 237 Scottsdale Drive, Robena QLD 4226  
info@thepositivelygoodco.com.au  
@plus\_plant



**FOR THE HUNGRY** 1000W 

- Get excited! Your Beef +Plant meal is going to be ready in 5 minutes.
- Remove the sleeve & pop it in the recycling.
- Prick the film with a fork.
- Heat on high for 5 minutes\* until heated through.
- Let stand for 1 minute while you hog impatiently from one foot to the other. Peel back film and serve.

**FOR THE WILLING** 

- Preheat oven to 180 °C.
- Flour yourself a welcome home drink. You deserve it.
- Remove the sleeve & pop it in the recycling.
- Remove the film.
- Heat for 15 minutes\* until heated through. Yep, you can pop this tray straight in the oven. Cool, hey?
- Put your feet up 'til the oven goes ding!

\* Every microwave and oven is different. Adjust accordingly.

9 421906 037128 >

Figure 5: Preliminary Pack design for Beef + Plant based protein product



Blended meatballs that taste great and are ALL GOOD.

GOOD Aussie Lamb + GOOD Plant Protein.

**Lamb + PLANT** MEATBALLS IN A FRESH & FIERY HARISSA STYLE SAUCE

**Lamb + PLANT**

MEATBALLS IN A FRESH & FIERY HARISSA STYLE SAUCE

100% Aussie Lamb Goodness

Pimped with Plants

A small change for a big impact.

HEALTH STAR RATING 4

SERVES 2  
MADE TO SHARE 600g

**Lamb + PLANT** MEATBALLS IN A FRESH & FIERY HARISSA STYLE SAUCE

TRY: Beef + PLANT / Chicken + PLANT

Why eat 100% plant based, when you can eat Lamb + Plant? We're giving you real lamb meatballs that just happen to be pimped with plant protein. That means they're really, really good for you. And, it's kinda like hiding the veggies on the kids, but without compromising the protein hit. You're welcome!

**INGREDIENTS**

+PLANT LAMB MEATBALLS (50%) (LAMB MINCE (86%), PLANT PROTEIN (28%) (CONTAINS WHEAT PROTEIN (WHEAT GLUTEN, WHEAT STARCH, COLOUR (CARAMEL E150d), SUNFLOWER OIL, MUSHROOM POWDER, ISOLATED PEA PROTEIN, LENTIL FLOUR, NATURAL FLAVOURS, RICE FLOUR, WHEAT FLOUR, WHEAT BRAN, SALT, MINERAL SALT (451, 450, 452), PAPRIKA OLEORESIN, HERB & SPICE EXTRACTS, CANOLA OIL, PARSLEY DRIED, CUMIN, CORIANDER, HARISSA STYLE SAUCE (50%) (TOMATO (86%) (PUREE AND PASTE (ACIDITY REGULATOR (CITRIC ACID)), WATER, RED WINE VINEGAR (10%), SUGAR (CARULO CRUSHED), TAPIOCA FLOUR, HERBS AND SPICES, CHILLI CRUSHED (RED CHILLI, CANOLA OIL, VINEGAR, SALT, ACIDITY REGULATOR (260i) (1%), SALT, YEAST EXTRACT AND THICKENER (XANTHAN GUM).

**CONTAINS: WHEAT, GLUTEN AND SOY PRODUCTS**

**NUTRITION INFORMATION**

Servings per package: 2 Serving size: 300 g

	Avg. Quantity per Serving	Avg. Quantity per 100 g
Energy	1695 kJ	565 kJ
Protein	31.0 g	10.3 g
Fat, Total	13.2 g	4.8 g
- Saturated	4.8 g	1.6 g
Carbohydrate	30.6 g	10.2 g
- Sugars	18.0 g	6.0 g
Dietary Fibre	14.7 g	4.9 g
Sodium	855 mg	285 mg

**STORAGE INSTRUCTIONS**

Keep refrigerated at 0-4° C. Consume immediately after opening & cooking. Please dispose of packaging thoughtfully.

**WE'RE THE MIDDLE GROUND**

We're the best of both worlds, the having your cake and eating it too. We're the full lamb experience, with added plant ingredients you won't even know are there. How good does that sound? As good as it tastes, friend... as good as it tastes!

100% AUSSIE LAMB  
GOOD SOURCE OF PROTEIN  
GOOD SOURCE OF DIETARY FIBRE

WHEN WE SAY WE CARE, WE MEAN IT:  
Our trays are made from recycled post-consumer material that can easily be recycled again, and again. So, pop our tray and sleeve straight in the recycling.

THE POSITIVELY GOOD CO.  
Suite 300, 237 Scottsdale Drive, Robins QLD 4226  
info@thepositivelygoodco.com.au  
@plus\_plant

**FOR THE HUNGRY** 1000W

- Get excited! Your Lamb + Plant meal is going to be ready in 5 minutes.
- Remove the sleeve & pop it in the recycling.
- Prick the film with a fork.
- Heat on high for 5 minutes\* until heated through.
- Let stand for 1 minute while you hop impatiently from one foot to the other. Peel back film and serve.

**FOR THE WILLING**

- Preheat oven to 180 °C.
- Pour yourself a welcome home drink. You deserve it.
- Remove the sleeve & pop it in the recycling.
- Remove the film.
- Heat for 15 minutes\* until heated through. Yep, you can pop this tray straight in the oven. Cool, hey?
- Put your feet up 'til the oven goes ding!

\* Every microwave and oven is different. Adjust accordingly.

9 421906 037142 >

Made in Australia from at least 72% Australian Ingredients

Figure 6: Preliminary Pack design for lamb + Plant based protein product

## 5.2 Nutrition

Red meats major benefit is natural high source of protein. RTC Foods prototype is specifically developed with a wheat-based plant protein, not vegetables, to best leverage protein content. Plant protein also gives a “Good Source” of fibre; 4gm of dietary fibre per 100gm, something that was of noted importance at the beginning to compete with plant-based meats. Most notably, all other nutritional benefits from the blended products are the same or better than plant-based meats. Of particular importance is the saturated fats. With only 1.5gm and 1.6gm per 100gm it is lower than the major plant-based alternatives, in fact, so low that there is no longer a need to reduce red meat which some call out as “the work has been done by this formulation”. Coupled with the dietary fibre RTC Foods product has produced a 4 Star Health Rating which is comparable to Weight Watchers meals.

Social media platforms will be used to advertise the benefits of red meat in a diet, and now in a convenient “modern meal” format that is targeted at the younger generations. This product will disrupt the plant-based marketing and further development of products will keep meat relevant and innovative.

The goal was to reduce the impact of plant-based meats negative messaging and hopefully get consumers to understand the benefits of eating red meat in a balanced diet. If this can be achieved, RTC Foods considers it will reduce the confusion around red meat consumption, and even increase sales into markets and segments that may not have previously considered red meat as part of their diet.

## 5.3 Launch

Products will be launched in Sydney through a chain of high-end grocers who saw the benefits of the product immediately. They see a growing flexitarian market and thought the branding and messaging was on point for this target market.

Parents looking for healthier options to feed children are another market they have also identified, which fits with the research of this being an obvious pain point for consumers.

Due to this being a completely new category sales are difficult to estimate, however initial orders are 600 trays of each product and expected to be reordered every 2 weeks over 30 stores. Future forecasts and business models will be explored thereafter.

## 5.4 Export

RTC Foods were particularly interested in main Asian trading partners in Japan, Korea, and Singapore. Unfortunately, COVID-19 has obviously suspended travel to these markets currently to pursue these in-person discussions. Testing products in these markets is on the agenda for when they open again as it is crucial in such a new category to have the ability to taste-test products.

RTC Foods have developed a product that is rather unique in concept as well as packaging. Applying the learnings from a previous MLA collaborative project (P.PSH.1208) there are known cooking techniques developed that give a 6-month chilled shelf life and up to 12 months with some products. This lends itself to further manufacturing and adding value in Australia with the added opportunity of branding and selling the Australian made story.

Initial interviews with importers in Singapore suggest plant-based burger launches in foodservice have been unsuccessful as consumers going to certain restaurants are looking for the meat experience. One importer suggested, vegans and vegetarians would not dine in meat restaurants so why are they there?

Beyond Meat has now launched into retail, therefore we can expect the same marketing in markets as plant-based foods increase their presence.

A good example of making sure to get it right for export comes from the CEO of a Singaporean plant-based start-up Eugene Wang, who commented “simply trying to sell plant-based patties in Asian countries would not cut it”. Seow Chin Juen, an analyst focused on food and nutrition in Asia, said the novelty aspect was currently driving most sales, but this was not sufficient to convert to mass market. Olivia Hang, a food and lifestyle writer in Singapore, agrees it will be slow to catch on, “we still like our chicken rice, we still like our spare-ribs”. This illustrates a lot more research on local products is required, and simply launching something that works in Australia will not necessarily work in export markets. However, if a blended option can give the consumer the benefits they seek in a traditional product, there may be more opportunities for Australian red meat to expand market share with further processed products (albeit leveraging plant protein blends). This may also introduce different market tariffs and quota considerations where relevant.

RTC Foods has a particular interest in the South Korean market, a large export market where lamb is not a frequently consumed protein. Some consumers have concerns about traditional lamb smell and are hesitant to cook it at home (MLA Market Snapshot 2019). This is of particular interest as it is believed by blending lamb with plant protein these negatives can be turned to positives and potentially open a new market for Australian further processed lamb products. Importantly, these products will have to be developed with the local consumer in mind and more in market research of retail and foodservice will be required to gain an understanding of products that could be offered.

In Southeast Asia improving household incomes are driving a rapid rise in red meat consumption, although again lamb is a less frequently consumed meat, with a lack of familiarity around cooking remaining a major barrier (MLA Market Snapshot 2019).

Blended meat – plant options that are cooked in ready meal trays could be an opportunity to grow lamb sales into these markets. RTC Foods have undertaken preliminary research showing blending lamb with plant protein reduces saturated fat and improves the natural mouthfeel of products. Cooked already in trays with other sauces or vegetables therefore decreasing the perceived smell could give Australian lamb a very important entry into markets that are underdeveloped. By products being further processed in Australia and branded, this will give Australian lamb an opportunity to brand here and sell the story with a chilled product. Targeting retail customers would allow in-store trials to show how easy Australian lamb can be prepared, and all associations with strong taste and smell can be tested.

This will be further tested and developed as markets open again for travel and concepts can be presented.

Exporting Australia’s red meat story is also of utmost importance. With the switch to focus on retail and marketing there is an opportunity to take products globally with chilled shelf life. RTC Foods have invested heavily in R&D on this product to be in a position to cook shelf ready trays (centre of plate meals) in recyclable oven ready packaging that have a branded sleeve ready for any shelf in the world. The opportunity this represents the red meat industry in Australia is twofold.

1. 'Made in Australia' branding will be a selling point in specific markets, opportunity to value add here in Australia and promote to the global market.
2. Increased returns on value added product will give the opportunity to identify specific supply opportunities and have the red meat story told through the brand.

## 6. Conclusions/ Recommendation

### 6.1 Conclusion

RTC Foods felt plant-based meat companies had the social media and mainstream media all to themselves over the last 18 months and decided that there needed to be products available that could disrupt this one-sided messaging. "Meat will always be meat" is the general feel and it is crucial plant-based meats are not left to catch up with the price, texture, and taste of red meat as this will eventually have a large impact.

There is only a certain amount of time to help consumers understand the benefit of red meat in a balanced diet. The Millennial and Gen Z demographics are already confused with the messages they are receiving with celebrity influencers all over social media either spruiking benefits of plant-based meat or promoting any negativity to the meat industry.

RTC Foods started developing a burger for direct comparison and competition to the plant-based market but felt without their marketing budgets or celebrity endorsement the message would be particularly difficult to get across in a food service setting.

With the outbreak of COVID-19 and inability to travel export opportunities became difficult, therefore time and resources were switched to developing a convenient on trend retail product that could be launched successfully in Australia, and the concept could also be used in any market in the world.

The two develop blended products – burgers and meatballs - have been successful and is now ranged by one of Sydney's top gourmet grocery chains.

### 6.2 Recommendations

#### Reduce Confusion

- Create modern, relevant red meat products that target the Gen Z and Millennial markets
- Clearly point out the benefits of a balance red meat diet
- Disrupt plant-based messaging with facts

#### Convenient and Affordable

- Create convenient, easy to cook and understand products
- Price realistically to encourage trial

#### Environmental Concerns

- Understand environmental concerns and participate in a solution
- Use recyclable packaging in everything we do
- Tell the story

### Product Cycles

- Food is fashion so it is essential to stay abreast of the latest trends
- Identify when the lifecycle is waning and ensure a replacement is ready to go
- Continually innovating to keep the message front of mind

### Branding

- Maintain core brand principles with everything, consumers need to be invested in the **why** as brand association is a strong influence in purchasing decisions
- Niche marketing built on integrity requires total transparency and interaction with your tribe otherwise you will be quickly replaced

### Build Relevant Export Opportunities

- Large opportunity to expand presence in current markets
- Increase market share of Australian red meat
- Opportunity to brand and retail pack in Australia and add value
- Help negative perceptions of lamb in Southeast Asia
- Sell chilled cooked products branded, reduce perception lamb is difficult to cook
- Reduce plant-based messaging as markets develop – be there first
- Add value in Australia, control the end product

## 7. References

Benson, T 2019, 'Meat Alternatives Will Let Kids Ditch Hamburgers For Happier Meals', *Fatherly.com Online Media*, viewed 17 March 2020, <<https://www.fatherly.com/health-science/impossible-burger-kids-and-plant-based-meat-alternatives/>>.

Beyond Meat, n.d., 'Beyond Meat Nutrition Information', *beyondmeat.com, Online Resource*, viewed 17 March 2020, < <https://www.beyondmeat.com/>>.

Clifford, T 2020, 'Impossible Foods CEO says the meat industry will be obsolete in 15 years – 'That's our mission'', *Mad Money Interview CNBC Online*, viewed 8 July 2020, < <https://www.cnbc.com/2020/06/23/impossible-foods-ceo-meat-industry-will-be-obsolete-within-15-years.html>>.

Food & Beverage, 2019, 'The effect of veganism on the meat industry', *Food & Beverage Industry News, Foodmag.com Online Media*, viewed 8 September 2020, <<https://foodmag.com.au/the-affect-of-veganism-on-the-meat-industry/>>.

Gelsomin, E 2019, 'Impossible and Beyond: How healthy are these meatless burgers?', *Harvard Health Publishing, Harvard Health Blog online*, viewed 1 April 2020, <https://www.health.harvard.edu/blog/impossible-and-beyond-how-healthy-are-these-meatless-burgers-2019081517448>.

Kids in the kitchen, n.d., 'Kids in the kitchen: Accelerating the shift to a sustainable food system', *Impossible Foods Insights Report online*, viewed 10 July 2020, <<https://impossiblefoods.com/insights/generationaltrends/>>.

Lang, M 2019, 'Consumer acceptance of blending plant-based ingredients into traditional meat-based foods: Evidence from the meat-mushroom blend', *Elsevier, Food Quality and Preference Online article*, viewed 18 March 2020, <https://doi.org/10.1016/j.foodqual.2019.103758>.

Laurence, E 2019, 'Blended Meat Products Aim to Reconcile Our Love of Animal Protein With a Need to Eat More Plants', *Well and Good.com Online Media*, viewed 13 August 2020, < <https://www.wellandgood.com/meat-blends-products-trends/>>.

MLA Market Snapshot, 2019, 'Market Snapshot Beef & Sheepmeat: Korea', *MLA.com.au Online Source*, viewed 30 July 2020, <<https://www.mla.com.au/globalassets/mla-corporate/prices--markets/documents/os-markets/red-meat-market-snapshots/2019/mla-ms-korea-beef-sheep-2019.pdf>>.

MLA Market Snapshot, 2019, 'Market Snapshot Beef & Sheepmeat: South-East Asia', *MLA.com.au Online Source*, viewed 30 July 2020, <https://www.mla.com.au/globalassets/mla-corporate/prices--markets/documents/os-markets/red-meat-market-snapshots/2019/mla-ms-south-east-asia-beef-sheep-2019-1.pdf>.

Neff, R, Edwards, D, Palmer, A, Ramsing, R, Righter, R & Wolfson, J 2018, 'Reducing meat consumption in the USA: a nationally representative survey of attitudes and behaviours', *Article in Public Health Nutrition, Cambridge University Press online*, viewed 18 March 2020, <doi.10.1017/S1368980017004190>.

Our Meatless Future: How The \$2.7T Global Meat Market Gets Disrupted, 2020, '*Plant-Based Meat Industry: Global Meat Market's Meatless Future, CB Insights Research Brief*', viewed 8 September 2020, <https://www.cbinsights.com/research/future-of-meat-industrial-farming/>.

Ponnampalam, E, Bekhit, A, Holman, B, Jayasundera, M, Lewandowski, P, Dunshea, F, Hopkins, D & Gill, H 2017, 'Use of Plant Materials to Enhance the Nutritional Appeal of Processed Meat Products', *University of Melbourne Research Paper online*, viewed 11 August 2020, <doi.10.4324/9781315371955>.

Protein – powered by a natural health halo, 2019, 'Key Trend 3: Protein – powered by a natural health halo', *New Nutrition Business, Online*, viewed 1 April 2020, <https://www.new-nutrition.com/>.

Scipioni, J 2019, 'Whole Foods CEO on plant-based meat boom: Good for the environment but not for your health', *Health and Wellness CNBC Online*, viewed 2 April 2020, <https://www.cnbc.com/2019/08/21/whole-foods-ceo-john-mackey-plant-based-meat-not-good-for-your-health.html>.

Shapiro, P 2019, 'For Plant-Based Meat, Will Falling Prices Mean the Sky's the Limit?', *Medium.com, Online Media*, viewed 4 March 2020, <https://medium.com/@PaulShapiro/for-plant-based-meat-will-falling-prices-will-mean-the-skys-the-limit-4beec8a0547b>.

Shapiro, P 2019, 'Of Hybrid Cars and Meat: The Protein Industry's New Blend Trend', *Medium.com, Online Media*, viewed 4 March 2020, <https://medium.com/@PaulShapiro/of-hybrid-cars-and-meat-the-protein-industrys-new-blend-trend-77c699546fbd>.

Sullivan, D 2020, 'Cargill launches plant-based patty and ground products', *Cargill.com Online Media*, viewed 1 April 2020, <<https://www.cargill.com/2020/cargill-launches-plant-based-patty-and-ground-products>>.