Final report

P.PSH.1175 - Fat Old Cow (Phase 3)

Project code: P.PSH.1175

Prepared by: Tim Burvill
South Australian Cattle Co

Date published: 6th June 2021

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.

Abstract

Txuleton (pronounced *choo-leeton*) is a type of beef produced from old cow in the Basque region in northern Spain and is renowned for its intensity of flavour. The reputation and regard for Txuleton beef has slowly spread from the Basque region locals, to some of the finest restaurants in the world. This project aimed to investigate whether Txuleton quality beef could be produced under Australian conditions from old cows.

Twenty older cows, 9 Simmental and 11 Friesian, were dried off and then pasture fed for 18 months in South Australia. During this time the cows gained a significant amount of weight and condition score (average condition score 5). The cattle were processed, the primals dry aged for 41 days and the meat assessed using MSA protocols.

The process of fattening old cows for an extended period appears to have a significant positive effect on the meat quality, including a noticeable uplift in the intramuscular fat/marble score level. Marble score levels in the cow beef assessed were significantly higher than would normally be found in manufacturing cow meat.

This project has demonstrated the potential to copy the production system in northern Spain under Australian conditions and in the process significantly value add to old cows.

Executive summary

Background

Txuleton (pronounced *choo-leeton*) is a type of beef produced from old cow in the Basque region in northern Spain and is renowned for its intensity of flavour. The reputation and regard for Txuleton beef has slowly spread from the Basque region locals, to some of the finest restaurants in the world.

This project aimed to mimic the quality of cow meat produced in the Basque Country region of Northern Spain by fattening cows under Australian conditions, and then assessing the resultant meat quality using MSA protocols and sensory analysis.

Objectives

The project origins reflect experience of a specialist production method practiced in Northern Spain where the resulting beef product, Galician Blonde, attracts premiums based on eating satisfaction. The beef is derived from aged cows, fed extensively for 18 months post their breeding and milk production life. The product reflects novel production practices at both farm and processing level and has not been previously evaluated within Meat Standards Australia (MSA) sensory cut x cook studies. The project objectives relate to evaluation of a similar process in Australia utilising aged dairy and beef breed cows, with cuts dry aged post slaughter, supported by formal MSA consumer and observational restaurant evaluation.

Methodology

Twenty older females, 9 Simmental and 11 Friesian, were slaughtered after 18 months of pasture finishing in southern Australian. The carcases were Achilles Tendon (AT) hung and, after overnight chilling, the primals were removed from each carcase side and transported to a dry ageing and boning facility in Mount Barker, South Australia. The beef was dry aged for 41 days before the beef was portioned and then data collated collected prior to fabricating to individual striploin, rump and tenderloin cuts.

Consumer grill and flavour chemistry samples were prepared from individual muscles resulting in 13 samples from each of 20 bodies. Samples were frozen at 43 days ageing and are currently being consumer tested, in conjunction with other MSA trial product, to ensure data linkage for MSA model relationship to other cattle types.

Results/key findings

In the absence of the sensory testing (due to COVID restrictions in Melbourne), the key finding on meat quality is that this production system has a significant positive effect on the intramuscular fat/marble score level. Of the 20 carcasses analysed, the minimum AUS-MEAT marble score level recorded was 1, the maximum was 7, and a mean score of 2.8. The minimum MSA Marble Score was 320, the maximum 950 and the mean score was 492. This is quite extraordinary for old cow beef.

Benefits to industry

There appears to be a significant carcase value add opportunity for older cows as they exit the breeding and/or milking phase of their lives.

Future research and recommendations

The positive effect on the cow meat quality demonstrated in this project warrants further investigation, to determine the parameters (time required on pasture and/or grain, weight gain, fat cover, breed) required to consistently produce high grade beef from older cows.

Table of contents

Executive summary **3**

1. Background **6**

2. Objectives **6**

3. Methodology **7**

3.2 Slaughter, collection and dry ageing of OP Ribs and Rump and Loins **7**

3.2.1 MSA grading inputs 7

3.2.2 Boning and muscle preparation 8

3.2.3 Sample Fabrication 8

3.3 Consumer testing **9**

3.3.1 Posting in preparation for consumer testing 10

3.3.2 Cooking and serving 11

3.3.3 Sensory scoring 12

4. Results **13**

5. Key findings **14**

5.1 Cattle Fattening **14**

5.2 Meat Quality **14**

1. Conclusion and recommendations **14**

2. Appendix **16**

Consumer testing score sheets **16**

1. Background

This project was funded through the Producer Fast Track program.

Txuleton (pronounced *choo-leeton*) beef, renowned for its intensity of flavour, has been described as unlike any other type of beef. The reputation and regard for Txuleton beef has slowly spread from the Basque region locals, to now some of the finest restaurants in the world. This project aimed to identify the potential for 'South Australian Cattle Company' to produce Txuleton quality beef from old Australian cows.

Through experiments in Phase 1 and 2 it was demonstrated that 'old fat cow' is significantly more preferred to standard beef in blind taste tests. Old Fat Cow steaks help high end restaurants and butchers who want to have a unique cut of beef to evaluate their brand image and product offer above their competitors by avoiding a standard choice of steaks and giving them a unique story to tell and sell.

This project aims to further develop the product in the Australian environment. The project aim is to mimic the quality of cow meat produced in the Basque Country region of Northern Spain. It may also identify which breed, if any, is more suited to this production system.

2. Objectives

1. Evaluate whether 'Old Fat Cow' can be cost effectively replicated in Australia and whether the eating quality of cow meat produced in the Basque Country region of Northern Spain can be replicated with Australian breeds. It will also identify which breed, if any, is more suited to this production system.
2. Further develop the business model and prototype MVP (Minimum Viable Product) for Old Fat Cow through:
    a. Continued customer validation activities to refine the customer segment and value proposition(s)
    b. Iteratively develop and refine, based on customer feedback, the prototype product(s) and/or service(s) toward achieving product – market – fit
3. Attend and report on the lessons learnt from two Aus-meat courses: Beef Chiller Assessment Course and the MSA Chiller Assessment Course
4. Project management, assessment, and final report submission
    c. Actively manage the project implementation and prepare monthly reports.
    d. Prepare milestone reports on concluding each milestone.
5. Prepare a final wrap up report

3. Methodology

3.1 Purchase and Fattening

Cows of beef and dairy breeds (Dairy - Holstein-Friesian and or Jersey, Beef; Beef – Angus, Hereford, or Simmental) were purchased. All cows had either been milking in a dairy or rearing a calf immediately prior to purchase. All cows were body condition score 3 at the time of purchase.

The cows were all tagged and weighed on the 27th of September 2019. Each cow was also drenched with Cydectin Pour-On, which is used to control internal and external parasites in cattle. The reason for doing this was to maximise weight gain of the cattle by eliminating parasites that may cause them to underperform. The cows were also injected with 2ml of a multivitamin product called Multimin. This injection is a source of zinc, manganese, copper, and selenium, which will have the effect of significantly increasing the trace mineral status of cattle for maximum performance.

The cattle were located at a farm in Padthaway, South Australia. This location is approximately 50km north of the town of Naracoorte, in the mid-south-east of South AUstralia, some 300km south-east of Adelaide. All cows were run under the exact some conditions in one group for 18 months prior to processing.

The cattle were processed after their allotted fattening time at Woodwards Meats in Swan Hill, Vic.

3.2 Slaughter, collection and dry ageing of OP Beef Ribs, Rump and Loins

Twenty older females, 9 Simmental and 11 Friesian, were slaughtered at a Northern Victorian abattoir on January 21st, 2021, after 18 months of finishing, in alignment with that observed in Galatia. The carcases were AT hung and after overnight chilling the OP Ribs (Handbook of Australian Meat - HAM 1601) and Rump (HAM 2081) and Loin (HAM 1540) primals were removed from each carcase side and transported to a dry ageing and boning facility in Mount Barker, South Australia.

3.2.1 MSA grading inputs

As the bone in primals were not identified to individual carcass and did not have MSA grading data possible MSA inputs were assessed from the cuts by a licensed MSA grader on March 12th, 2021, after 41 days of dry ageing. Hump height assessment and carcase weight were not possible for individual bodies, but rib fat, marbling, pH and meat colour were possible and recorded. There were also challenges in relating the individual rib and loin portions, but evaluation of the spinal vertebrae and remaining rib portions confirmed a maximum 590 ossification score. To ensure each carcase was evaluated, the left side rump and loins were selected for consumer sample fabrication. Each of the 3 component primal cuts were identified by a coloured laminated tag with a number (1 to 20) identifying the rump and loin/body and a unique MSA Primal ID which was pinned to each cut using stainless steel pins. A DNA sample was taken from each rump and loin.

3.2.2 Boning and muscle preparation

It was elected to fabricate sensory samples from the striploin (HAM 2140), D-Rump (HAM 2100) and Tenderloin (HAM 2160) primals, utilising each of the left side rump and loin portions. The OP rib was not fabricated as the principal *M.longissimus dorsi* muscle as that particular muscle was well represented in the striploin and the smaller *M.spinalis dorsi* was not considered commercially relevant for long dry aged portions. Two expert plant butchers boned each rump and loin portion and then further prepared each primal.

A 150mm anterior portion of the striploin was removed and the *M.longissimus dorsi* muscle from this piece was fully denuded. The tenderloin was denuded, removing the sidestrap and silverskin, then separated into the *M.psoas major* and *M.illiacus* component muscles. The rump was also denuded and the two major component muscles, *M.gluteus medius* (Rostbiff, HAM 2110) and *M.biceps femoris* (Rump Cap HAM 2091) removed. The rostbiff was further fabricated creating two portions by removing the major gristle seam, the smaller 1/3 portion, MSA coded as RMP131 and larger 2/3 portion coded MSA231.

To retain identification to the source rump and loin the fabricated muscle portions were placed on plastic trays and the laminated label and pin retained in each.

3.2.3 Sample Fabrication

The trays and labelled muscle portions were moved to a fabrication area for conversion to MSA consumer and flavour samples following MSA protocol. Prior to fabrication the MSA Primal ID number on the laminated label pinned to each portion was referenced in a pre-printed bound book containing the “CutUpFile” and related Avery self-adhesive labels. The file and labels were produced from MSA CUD (Cut Up Developer) software used to design MSA cut collections and provide unique ID.

The CutUpFile dictated the sample(s) to be produced from each muscle, the cooking method form, the position each was to be prepared from and the unique label to be attached to the final sample vacuum bag. A portion of the file is shown in Figure 1 and of the related Avery labels in Fig 2.

Seq	EQS	Primal	Cut	Cook	Age	Pos	Kill
AUS128356	E8N9	64586	TDR034	FLV	43	F	Thu 28 Jan 21
AUS128357	E5A0	64586	TDR062	FLV	43	F	Thu 28 Jan 21
AUS128482	J1K6	64586	TDR062	GRL	43	C	Thu 28 Jan 21
AUS128608	Z8W2	64586	TDR034	RST	43	C	Thu 28 Jan 21
AUS128358	M9M2	64587	STR045	FLV	43	F	Thu 28 Jan 21
AUS128483	Z4W6	64587	STR045	GRL	43	A1	Thu 28 Jan 21

Figure 1. Portion of CutUpFile

64586	AUS128356 E8N9 64586 FLV F TDR034 1203	AUS128608 Z8W2 64586 RST C TDR034 1203
AUS128357 E5A0 64586 FLV F TDR062 1203	AUS128482 J1K6 64586 GRL C TDR062 1203	64587
AUS128358 M9M2 64587 FLV F STR045 1203	AUS128483 Z4W6 64587 GRL A1 STR045 1203	64588

Figure 2. Example of Labels used for consumer sample identification.

The sample label contained a unique numeric sequence number and an EQSRef, 4-digit, alpha numeric code that was retained throughout to individual consumer plate identification. This code was in turn related to all data in the MSA research database for that sample, muscle, primal, body and group of cattle.

The Avery labels were attached loosely to the edge of the tray and samples fabricated to align with the instruction. A cutting jig was utilised to produce uniform 25mm slices cut across the grain. The grill samples required 5 small 75 x 35mm x 25mm thick steaks for each (to be halved and served to 10 consumers after cooking). A further sample of the same dimension was prepared for flavour chemistry analysis. The *M.illiacus* (head of the tenderloin – MSA code TDR034) was prepared as a small roast whereas all other muscles were prepared as grills. The samples were placed back on the tray adjacent to the label(s) and the tray moved to a final packing position.

The labels were placed on 200 x 250mm vacuum bags and the corresponding sample portion(s) packed with each of the 5 grill steak portions individually wrapped in freezer wrap to enable them to be separated while frozen as required in sensory procedures.

Each of the 260 prepared sample bags (13 per rump and loin portion) was vacuum packed, chilled overnight, then packed in foam for transport to Wagga next day where they were frozen.

3.3 Consumer testing

MSA consumer protocols were utilised for evaluating each sensory sample, with 5 sensory samples from every carcase, in addition to those stored for flavour chemistry. The protocols specify that 10 consumers evaluate each sample and that the 10 consumers be served as 5 pairs of 2. All consumers are first served a “Link” sample that is expected to be of mid quality. This sample is used to establish a common starting point and is not used in product analysis. After the Link every consumer is served 6 samples, one from each of a designated 6 products. Each pair receives their portion of a particular sample in a different serving position and order. This ensures that potential “halo” (the sample before influencing the score of the next sample) and order (whether served second to seventh) are

balanced so as not to bias results. The serving order follows a 6x6 Latin Square with the numbers in *Figure 3* being product number served. The Latin square arrangement ensures that every product is served an equal number of times in each order position and before and after each other product.

	Consumer Number					
Serving Order	1 & 2	3 & 4	5 & 6	7 & 8	9 & 10	11 & 12
First	LINK					
Second	1	2	3	4	5	6
Third	2	4	1	6	3	5
Fourth	3	1	5	2	6	4
Fifth	4	6	2	5	1	3
Sixth	5	3	6	1	4	2
Seventh	6	5	4	3	2	1

Figure 3. Latin square serving order (Number is product served)

Five Latin squares are utilised in each 'pick' with further detail ensuring that the 5 portions of any sample are served once in each of the 5 sets of 12 consumers (in different order) to guard against any bias related to specific sittings or consumer grouping.

For grill testing consumers were served in three sittings of 20 whereas roasts were served to a single 60 person sitting. The 3 x 20 or 60 people are described as a "pick". Every pick evaluates 36 test samples and 6 links to produce 420 individual lines of data, 10 for every sample. The protocols also dictate that the 6 products should vary from each other in expected eating quality so that every consumer receives samples from expected very poor to very high eating quality. The desired product range is created by allocating samples to the 6 products within each pick. Consequently product 6 may be tenderloin and product 1 topside for example, or be from different cattle types, ageing periods, or treatments to create range.

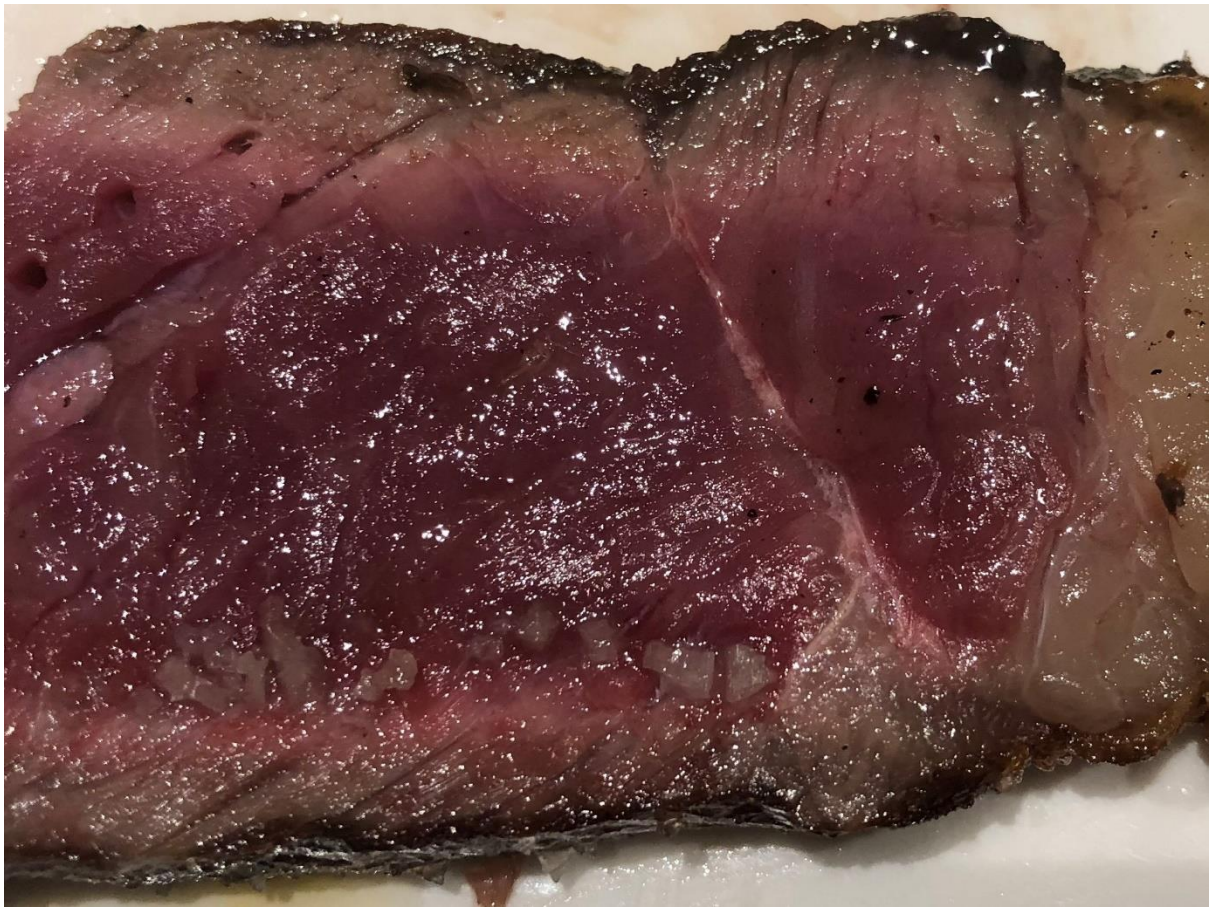
3.3.1 Posting in preparation for consumer testing

To achieve the designated product serving order within each pick, the selected samples, each with 5 portions, were firstly picked and, when confirmed as found, posted, remaining frozen throughout. The posting process assigned each of the 5 portions to a specific cooking "round" and to two designated consumers. This was achieved by placing 10 steak portions on to each of 21 "round sheets" which had the relevant sequence and EQSRef codes printed in a 3 - 4 - 3 layout. The EQSRef code for each sample on a round sheet was called by one person with a second locating the correct bag, calling back the sequence number and when confirmed passing one portion to the caller. The 10 portions were placed over their printed ID and the sheet vacuum packed to hold them in position. The completed pick of 21 frozen sheets was then packed in foam for transfer to the test venues as

required. All picking and posting was conducted at CSU (Charles Sturt University) Wagga meat laboratory.

3.3.2 Cooking and serving

The pick round sheets were placed in a refrigerator 24 hours prior to the consumer test session to thaw slowly. The round sheets were used to control cooking order with Round 1 - Session 1 the first 10 steaks to be served to consumers 1 to 20 etc. A 3 phase Silex S-Tronic 165 grill was used to cook all steaks with 10 portions cooked at one time (round). Portions were placed on the grill and removed strictly in the 3-4-3 layout to retain sample ID. Cooking time was controlled by adherence to a timer that dictated the time of loading, lid closure and removal for every round with the grill set at a designated temperature (specific to each unit but close to 200˚C) and a 5-minute cook time to achieve medium doneness. After removal, the portions were rested for 2 minutes and then halved with each served to a specified consumer pair with ID cross checked against the plate and questionnaire labels.



3.3.3 Sensory scoring

Consumers were seated in COVID complaint format ensuring a minimum 2 metre separation and also placed to ensure that each consumer pair was not seated at a common table. Once seated, each session was briefed on the testing and scoring procedure before completing a basic two-page demographic questionnaire.

A single page score sheet was then utilised for each sample with the EQSRef the only identification. Consumers were asked to mark four 100 mm line scales to indicate their individual ratings of the sample tenderness, juiciness, flavour, and overall liking. After marking each line, they selected one of four category boxes described as unsatisfactory, good every day, better than every day or premium quality. Serving staff checked that each line had been marked and a box selected before the next sample was served and a new page marked.

A final sheet, after the 7 samples, was then marked to record willingness to pay prices/kg for each category description, again utilising a line scale denoting $/Kg.

The questionnaire formats are attached in the Appendix for reference.

The completed questionnaires are being double entered and cross checked to ensure accurate line measurement and coding prior to them being electronically forwarded for further checks and linking to the MSA research database. The database aligns the sensory results with all previous animal and process data from which statistical analysis will be conducted.

4. Results

Average carcase weights of 358kg and 400kg were reported for the Friesian and Simmental groups respectively. Table 1 displays the individual MSA input values for each body and summary statistics.

Table 1. Individual body MSA inputs and summary statistics

Body	EMA	Rib Fat (mm)	Ossification	Marbling		Meat Colour	Ultimate pH
				MSA	AUS-MEAT		
1	51	8	590	400	2	4	5.66
2	59	3	590	550	3	4	5.71
3	73	15	590	500	3	3	5.67
4	53	5	590	420	2	4	5.76
5	41	4	590	620	4	4	5.67
6	37	4	590	950	7	2	5.8
7	38	15	590	450	2	4	5.75
8	65	5	590	470	2	3	5.68
9	39	5	590	700	5	3	5.71
10	34	3	590	400	2	5	5.71
11	39	3	590	350	1	3	5.64
12	44	2	590	510	3	4	5.72
13	54	27	590	470	3	5	6.04
14	47	9	590	600	4	4	5.64
15	49	10	590	420	2	4	5.63
16	41	12	590	470	3	4	5.72
17	42	23	590	370	2	3	5.64
18	47	6	590	320	1	4	5.76
19	82	9	590	390	2	3	5.69
20	54	13	590	480	3	2	5.69
Min	34	2	590	320	1	2	5.63

Max	82	27	590	950	7	5	6.04
Mean	49.45	9.05	590	492	2.8	3.6	5.7145
Stdev	12.54	6.82	0.00	143.37	1.40	0.82	0.09

While half the striploin pH values exceeded the MSA maximum of <5.71, only one was excessive at 6.04. In addition pH was measured on other muscles.

Some care may be needed with future consignments however to avoid non-compliance to MSA minimum requirements.

A considerable range of marbling and rib fat was recorded with only one body outside MSA rib fat limits (greater than or equal to 3mm). The marbling and rib fat means were relatively high and widely distributed which will provide very useful data for subsequent modelling.

5. Key findings

5.1 Cattle Fattening

We were very surprised that some of the cows calved down a few months into the pasture fattening phase, as we were advised the cows were empty when purchased. In future, cows used in this production system should be administered a prostaglandin injection at the beginning of the fattening period to eliminate the likelihood of this happening.

In addition, attention should be paid to the frame size of the cows used. The Holstein-Friesian is a large breed of cow, and some of the noticeably big, framed cows took a lot longer to fatten compared to the medium and small framed cows.

5.2Meat Quality

The meat quality based on marble score alone seems to be a lot higher than would be expected from manufacturing beef (which is produced from old cows). A mean marble score of 2.8 is far above any expectations we had. Sensory trials on the meat, will hopefully further support, very good quality beef can be utilised using old cows fattened on grass. Unfortunately, due to covid and lockdown restriction in Melbourne, the trial could not occur.

6. Value Proposition

The desirability for older cattle is in demand and gaining momentum as a sought-after source of protein. Though technically aged, research has shown that meat from mature animals has a depth of flavour that is not replicable in traditional slaughter cattle. Consequently, new possibilities exist for cattle past their prime for providing milk or breeding beef calves. This reputational and regard for aged beef is slowly spreading from just the Basque region in Spain to some of the finest restaurants in the world.

By demonstrating that 'old, fat cow' is significantly more preferred to standard beef, this product helps high end restaurants and butchers who want to have a unique cut of beef to evaluate their brand image and product offering above competitors.

In 2020 the national beef cow and heifer herd aged over one year was reported at 11.7million. Further, the cattle supply is expected to tighten as producers retain more breeding stock to rebuild their herds after the prolonged drought period in Australia. The expected size of the prize for Australian producers who replicate the Basque Beef production model with older cows could be a significant value add given the average price for dairy cows is currently $2.62/kg.

Sale Prefix	Head	wow Head	Average Price (c/kg lwt)	wow (c/kg lwt)
Dairy	2	NQ	262.00	NC
Feeder	15	-14	272.00	-36.18
Pastoral Cattle	5	NQ	180.00	NC
Processor	660	-16	271.59	-10.42
Restocker	36	26	279.94	-28.26

7. Conclusion and recommendations

This project shows that the Txuleton style of beef produced from old cows in the Basque region in northern Spain can be replicated here in Australia. It potentially has significant ramifications for the Australian beef and dairy industries, as old cows tend to only be classified as manufacturing beef and hence destined for low-value products, such as grinding beef.

Potentially, the old breeding or dairy cow could produce some of the highest quality beef on the farm if a system of fattening dry cows is used. Past reports suggest that in typical southern Australian beef herds, 60-70% of the breeding herd are ≤ 6 years old and the maximum age of the cows is between 8 – 10 years. This leaves a significant portion of the older breeding herd suitable for a fattening system.

The recommended next steps for this project are:

- To do a sensory analysis (pervious trial did not occur due to covid)
- further expand trial where:
    - more cow breeds are used
    - different production systems are compared i.e., grass vs grain feeding and/or length of time on gain and/or grass

South Australian Cattle Co. Pty Ltd would very much like to run the next phase of this project in conjunction with MLA.

8. Appendix

Consumer testing score sheets

Thank you for your participation today with our meat tasting

Our team is here to help you during your session and make this easy for you.

Before you start please listen to the instructions on how to use the scales contained in this questionnaire

Please use a blue pen to fill in the form and where asked:

Write crosses in boxes like this.....

Mark on the line scale like this....

In between each sample please cleanse your palate by:

* first..... Taking a sip of diluted apple juice
* then..... Chew a piece of cracker
* and then..... Take another sip of diluted apple juice

We are after YOUR opinion and therefore ask that you do not talk to anyone else in the room during the research session.

Now just a few questions about yourself (All this information is strictly confidential)

Date D D M M Y Y Y Y

Your Group's Name _____

1. **Please write in the boxes the postcode you normally live in** ☐☐☐☐
2. **Age Group:** (Use **X** in one box only)

   18-19 ☐ 20-25 ☐ 26-30 ☐ 31-39 ☐ 40-60 ☐ 61-70 ☐ 70+ ☐
3. **Gender:** (Use **X** in one box only)

   Male ☐ Female ☐ Other ☐
4. **What is the occupation of the main income earner in your household?:** (Use **X** in one box only)

   ☐ Manager
   ☐ Professionals (includes health professionals etc.)
   ☐ Technicians and Trade Workers
   ☐ Community and Personal Services Workers
   ☐ Clerical and Administrative workers
   ☐ Sales Workers (includes retail sales etc.)
   ☐ Machine operators and Drivers
   ☐ Labourers
   ☐ Home Duties
   ☐ Student
   ☐ Other

Please fill in the form and write crosses in boxes like this 

5. How often do you eat Beef?
(in any form such as steaks, roasts, stews, Casseroles, kebabs, BBQ etc.?)
(Use **X** in one box only)

- ☐ Daily
- ☐ 4-5 times a week
- ☐ 2-3 times a week
- ☐ Weekly
- ☐ Fortnightly
- ☐ Monthly
- ☐ Never eat beef

6.1. How many adults (18 and over) normally live in your household?
(Use **X** in one box only)

- ☐ 1 Adult
- ☐ 2 Adults
- ☐ 3 Adults
- ☐ 4 Adults
- ☐ 5 Adults
- ☐ 6 Adults
- ☐ 7 Adults
- ☐ 8 and over adults

6.2. How many children under 18 years normally live in your household?
(Use **X** in one box only)

- ☐ 0 Children
- ☐ 1 Child
- ☐ 2 Children
- ☐ 3 Children
- ☐ 4 Children
- ☐ 5 Children
- ☐ 6 Children
- ☐ 7 and over children

7. Please read the following statements and use X in one box only for the one statement that applies to you

- ☐ I enjoy beef. It's an important part of my diet
- ☐ I like beef well enough. It's a regular part of my diet
- ☐ I do eat some beef although, truthfully it wouldn't worry me if I didn't
- ☐ I rarely / never eat beef

8. When you eat Beef, such as steak what level of cooking do you prefer?
(Use **X** in one box only)

- ☐ Blue
- ☐ Rare
- ☐ Medium / Rare
- ☐ Medium
- ☐ Medium / Well done
- ☐ Well done

9. What level of income best categories your combined household income?
(Use **X** in one box only)

- ☐ Below $25,000 per year
- ☐ $25,001 - $50,000 per year
- ☐ $50,001 - $75,000 per year
- ☐ $75,001 - $100,000 per year
- ☐ $100,001 - $125,000 per year
- ☐ $125,001 - $150,000 per year
- ☐ More than $150,000 per year
- ☐ Prefer not to say

10. What level of education have you reached?
(Use **X** in one box only for the highest level achieved)

- ☐ Did not complete Secondary School
- ☐ Completed Secondary School
- ☐ A College/ TAFE course
- ☐ University Graduate

11. What is your cultural heritage?
(Use **X** in one box only)

- ☐ Australian
- ☐ British descent
- ☐ European descent
- ☐ Asian descent
- ☐ Other
- ☐ Prefer not to say

All information collected in this survey is strictly confidential

PRODUCT:

Tenderness

Not Tender — Very Tender

Juiciness

Not Juicy — Very Juicy

Liking of Flavour

Dislike Extremely — Like Extremely

Overall Liking

Dislike Extremely — Like Extremely

Please mark [X] in one of the following boxes to rate the quality of the Beef sample you have just eaten

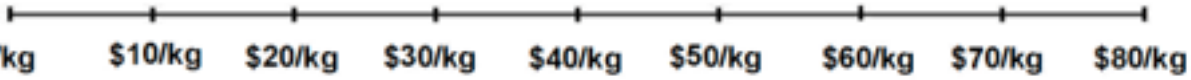
Choose **one** only (you must make a choice)

- ☐ Unsatisfactory
- ☐ Good everyday quality
- ☐ Better than everyday quality
- ☐ Premium quality

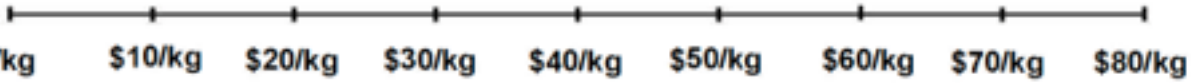
Based on the range of beef samples you have just consumed:

Please mark the line at the price per Kg you believe best reflects the value for each category.

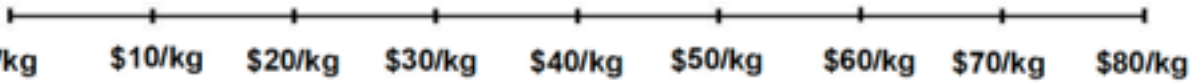
For the sort of meat you rated "Unsatisfactory Quality"



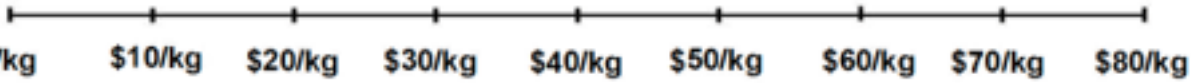
For the sort of meat you rated "Good Everyday Quality"



For the sort of meat you rated "Better Than Everyday Quality"



For the sort of meat you rated "Premium Quality"



Are you the regular purchaser for your family? (Use **X** in one box only)

☐ Yes

☐ No