The Fiji Beef Industry

Country report for ACIAR Project LS/2018/102

"Research opportunities for small-holder beef cattle systems in Pacific island countries"

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Acronyms

AI	Artificial Insemination
AU$	Australian Dollar
BTEC	Brucellosis and TB Eradication Committee
CIA	Central Intelligence Agency
DAHP	Department of Animal Health and Production
EDF	European Development Fund
ET	Embryo Transfer
FAO	Food and Agricultural Organisation of the United Nations
FAOSTAT	FAO Statistics, Food and Agricultural Organisation of the United Nations
FCDCL	Fiji Co-operative Dairy Company Ltd
FDB	Fiji Development Bank
FMIB	Fiji Meat Industry Board
GDP	Gross Domestic Product
HS	Harmonized System
kg	Kilogram
Magiti	Fijian Function
MoA	Ministry of Agriculture
MSG	Melanesian Spearhead Group
NAC	National Agricultural Census
SME	Small to medium enterprise
SPB	South Pacific Butchery
TB	Tuberculosis
TLTB	iTaukei Land Trust Board

1 Introduction

1.1 Background to report

The beef cattle sector plays a significant role in livelihoods in many Pacific island countries (PICs). Contributions of the industry vary by locality but includes contributions to localised consumption and ceremonies, rural incomes, downstream industry and trade. Benign tropical systems in the region are well suited to well managed cattle production systems, and under-utilised resources are available to boost productivity in some countries. There is robust demand for beef in a diverse range of markets.

Cattle production is however stagnant in nearly all countries and small-holder segments of the industries are under-performing. All national governments are interested in building or revitalising beef industries to various degrees. The sector is under-invested and under-researched and policy is not necessarily informed by detailed, household-level or up-to-date research.

Against this background, ACIAR commissioned a Small Research Agreement to investigate research opportunities for small-holder beef cattle systems in the Pacific namely Fiji, Vanuatu, Samoa, Tonga and the Solomon Islands.

This report provides a brief descriptive analysis of the Fijian beef industry. The research was conducted in 2018 using the following methods:

- A review of existing published or unpublished literature on the Fijian beef industry.
- Statistics collected from international databases, from government sources and from industry.
- A scoping trip, including interviews and field visits with government agencies, extension and education providers and the commercial sector (small holder and large holder cattle producers, abattoirs, butchers, input suppliers).

This country report on Fiji will be combined with country reports from Vanuatu, Samoa, Tonga and the Solomon Islands to identify priority areas of research in beef cattle production and marketing in the Pacific that falls within the remit of ACIAR

1.2 Summary

Fiji is one of the most developed island economies in the Pacific outside those directly supported by France and the United States of America. Over 50% of Fiji's 900,000 population was recently classified as urban. However, Fiji maintains a large subsistence agricultural sector where beef is usually a secondary output from cattle after draught and milk production.

The Census of 2009 (DoA and FAO, 2009) gives the best indication of cattle numbers in the country, estimated to be 134,800 cattle. However, only 15% of the holdings are classified as commercial beef producers while a further 41% are classified as subsistence beef producers. The commercial dairy sector was estimated at 17% of dairy producers. Numbers are expected to fall in the upcoming 2019 Census due to cane farmers leaving cane production or switching to mechanised cultivation and Tuberculosis (TB) forecast to reduce the dairy industry by 40% of total stock

Commercial beef output, slaughtered through the government abattoirs of the Fiji Meat Industry Board (FMIB), is about 7,000 cattle per year, producing 2,000 tonnes of beef, mainly from culled working bullocks and dairy cows. Only 15% of cattle slaughtered are identified as prime steers. Informal production and consumption is centred around village cattle with a significant demand from the Muslim community for festivals such as Qurbani. Informal production accounts for a similar number of cattle as the commercial sector.

There is one large beef farm (Yaqara) that extensively grazes 4,500 cattle on the dry side of the island of Viti Levu. There are about 50 smaller commercial herds averaging 70 cattle that exist typically within old coconut plantations in the wet areas of the northern islands of Vanua Levu and Tavenuni which is considered the best quality beef in the country.

Production efficiencies in the commercial farms is good with calving percentages between 60% and 80%, low mortality and reasonable growth rates. Cattle from these grassland, single suckled systems are typically turned off at about three years of age. Commercial beef systems also include sufficient infrastructure including paddock systems, yards, and improved pastures.

Tropical pastures are characterised by fibre levels above 33%. Typical pastures include guinea grass and signal grass on the dryer lands and Batiki Blue on wetter areas. New species have been recently introduced including Mulato II. Improved species do not predominate in the informal sector and weed infestation is commonplace.

It is very difficult to maintain purebred stock in a small industry. However, imports of Santa Gertrudis, Limousin and Brahaman lines can be identified. Recently Drought Master, Senepol and Swiss Brown cattle have been introduced. To mitigate risks of disease from imported breeding stock, Fiji now conducts core breed improvement through embryo transfer (ET) and artificial insemination (AI).

Beef consumption ranks third in Fiji after more religiously acceptable poultry and mutton products. Over 30% of Fiji's population are ethnically Hindu and do not consume beef. Local definitions of beef quality are very different from a western concept of beef quality, where wet cooking techniques tenderise low quality beef and retain flavour, creating higher demand for low quality beef. Assessment of quality at slaughter is also rudimentary.

Fiji imports 5,500 tonnes of beef, of which 90% is frozen, mainly low-quality meat. An additional 1,250 tonnes of beef offal are also imported. The major import is very low-quality beef products used for canning in a price conscious market, of which, 880 tonnes is re-exported. Duty on imported beef ranges from 15% to 32%.

Because the quality and volume of Fiji beef cannot be guaranteed, the top end tourist industry typically imports prime cuts.

An efficient system of middlemen agglomerate cattle from the small-holder sector and deliver to one of the two abattoirs owned and operated by the FMIB. The FMIB historically acted as a service provider but has now ventured into supplying beef cuts directly to the retail market. The retail market is competitively serviced by a range of private butchers.

Current research and extension activities in the beef sector include the introduction of new pasture and cattle species to multiplier farms seen as the best mechanism to develop the industry.

The largest farms access improved pasture and breed types, financing, and veterinary services. This does not extend and is not sought by the majority small-holder farmers. As a result, the uptake of new technologies is minimal.

2 Underlying geographic and economic structures

1.1 Geography

Fiji occupies 18,274 km² of land, is located at 18° south of the equator and straddles the international dateline in the east of the country[2]. The country has a tropical marine climate with prevailing south-easterly winds causing significant rainfall in the south-east corners of the largest islands and distinct dry zones in the north-west. 24% of the land area is classified as agricultural of which 9.6% is permanent pasture and forest occupies 55.7% of the total land area.

About 70% of the 900,000 people in Fiji live on the mainland of Viti Levu. Half the population are now classified as urban dwellers.

Fiji is exposed to considerable natural hazards including cyclone and drought.

1.2 Economic

Fiji is endowed with agricultural land, forest, mineral, and fish resources. It is one of the most developed and connected of the Pacific island economies (CIA, 2018). Growth for 2018 is estimated at 3.6% and projected at 3.3% in 2019. However, it remains a developing country with a large subsistence agricultural sector. It relies heavily on tourism (842,884 tourists visiting in 2017), bottled water exports, and remittances for foreign exchange earnings. Fiji's sugar sector remains a significant industry and a major export, however crops and one of the sugar mills suffered damage during Cyclone Winston in 2016. Fiji's trade imbalance continues to widen with increased imports and sluggish performance of domestic exports.

Private sector investment in 2017 approached 20% of GDP, compared to 13% in 2013. In 2017, the government was running a deficit budget of 4.8% of GDP, had a public debt of 46.6% of GDP, and inflation in 2017 remained steady at about 3.5%. Interest rates remain low even in the agricultural sector.

Most imports come from Australia and New Zealand with Singapore accounting for 17% of the value of imports; as Fiji's source of oil and imports from China are growing in volume.

1.3 Development trends and forecasts

GDP per capita has been growing at over 3% for the last few years and stands at over FJD $9,000 per capita in 2017. This level of GDP excludes Fiji from many lower value grants and loans from international institutions. Fiji has the highest GDP per capita of the Pacific island nations excluding those supported by France and the USA.

The steady growth forecast for Fiji is backed by its strong tourism and agriculture sectors which the ADB says should continue to lift the Fijian economy.

[2] CIA Fact Sheet Fiji

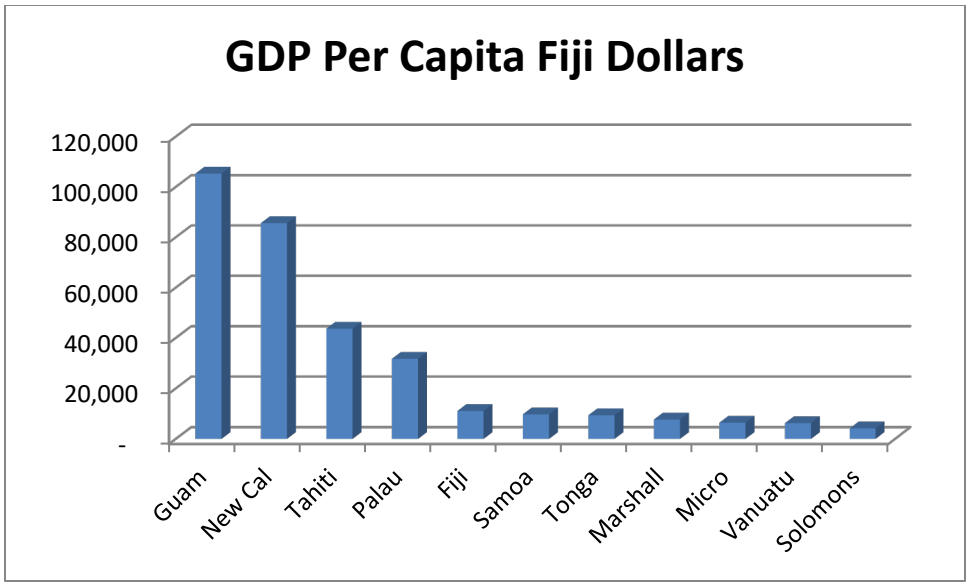

Figure 1: Regional GDP per capita comparison

Source: Cole (2016).

Agriculture makes up 10.6% of GDP, with industry at 17.9%. The large tourist sector drives the service sector at 71.5% of GDP. However, over 44% of the total population is employed in agriculture, with 14% in industry and 42% in the service sector. Up to 30% of the population are estimated to live below the poverty line.

3 Meat industry structure

3.1 Meat consumption

Fiji consumes close to the world average for meat (Table 1). This is well below the major meat-eating countries, characterised by higher GDP per capita such as Australia. However, over 40% of Fiji's population is ethnically Indian with a large majority vegetarian and an even larger proportion unlikely to eat beef. Thus, beef consumption amongst other ethnic groups is likely to be high.

Pork in the Fijian community is typically reserved for ceremonial occasions and not regularly eaten as a weekly meal. Therefore, it is tourism that drives the demand for commercial pork.

Locally produced poultry and imported mutton are the most culturally acceptable meats with the highest consumption levels. Imported low quality mutton used to be the cheapest meat available in Fiji. However declining poultry prices and increasing mutton prices has seen poultry rise to be the single largest meat product consumed in Fiji (60%) (Figure 2).

Table 1: Meat consumption in Fiji compared to world average

Meat consumption (kg/per capita)	Beef	Pork	Poultry	Mutton	Other	Total
Fiji	10.2	4.6	18.7	10.6	0.1	44.2
World average	9.5	14.9	12.5	1.9	0	38.7
Australia	43.5	23	39.3	14.3	1.1	121.2

Source: SCRIBD (2018)

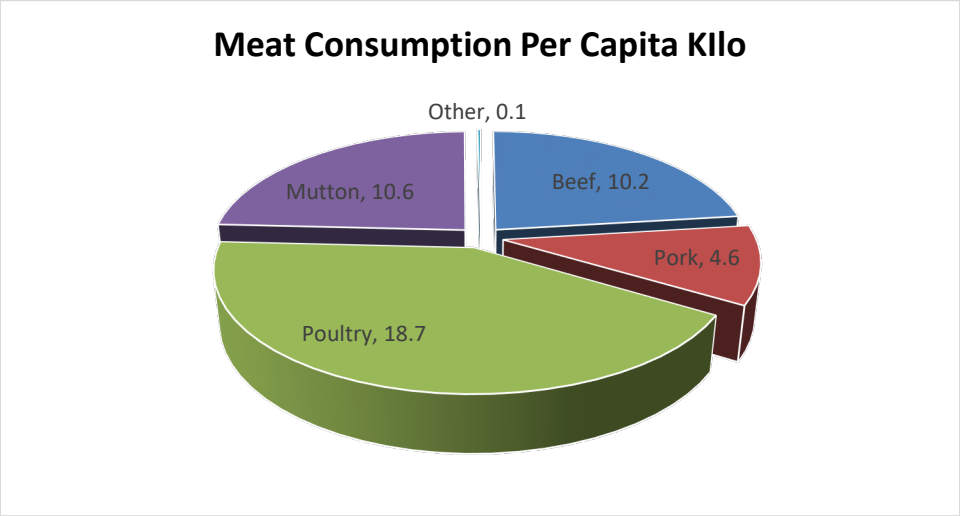

Figure 2: Meat consumption in Fiji by type

Source: SCRIBD (2018)

It is important to note the Fiji, unlike much of the rest of the Pacific, does not allow in cheap leg quarter chicken from the US or elsewhere holding up Newcastle disease as a non-tariff barrier. This allows for larger and more diverse domestic meat production and consumption.

3.2 Domestic livestock and meat production

By far the single largest meat volume produced in Fiji is poultry. The poultry industry is centred around two large production facilities one in the Central division and one in the Western division. As well as being the largest single meat commodity, there are large commercial poultry producers in Fiji that have low cost structures. The production of local sheep and goat meat is very small and not commercialised (see Table 19, FMIB). Commercial pork production is centred around three large piggery farms consisting of over 300 sows each. A total of 20 small to medium size producers make up the remaining supply of commercial pork. However, most villages keep pigs, particularly on the outer islands, and this informal production possibly exceeds the total commercial output.

As with pork, beef is largely produced in the informal sector. Village cattle, working bullocks, and cull dairy cows are sold directly into the rural community and dominate commercial production. The major Muslim festival of Qurbani is possibly the single largest informal slaughter of cattle throughout the year.

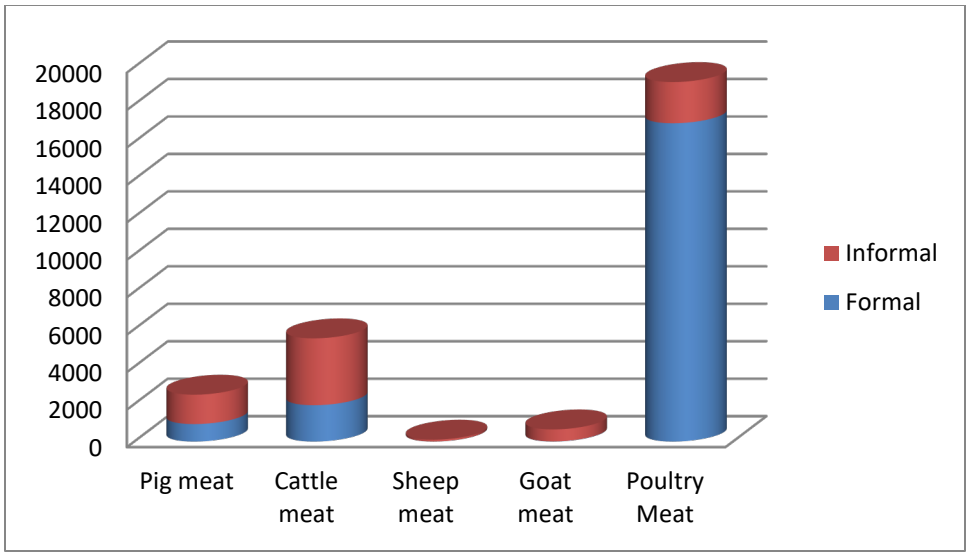

Figure 3: Formal and informal meat supply (tonnes) in Fiji

Source: Cole and Marlow (2012)

Cattle are located mainly in the Western division of Viti Levu and on Vanua Levu, both are cane growing areas, again indicating the link to the cane sector. Beef cattle are also prevalent on the outer islands in various systems including grazing under coconuts.

There is a large discrepancy between cattle statistics reported in the 2009 National Agricultural Census (NAC) (DoA and FAO, 2009) and annually in FAOSTAT (various years). The NAC recorded 134,600 cattle, well below the 300,000+ cattle recorded in FAOStat. The total number of stock reported by FAOStat (various years) and in Table 2 and **Error! Reference source not found.** is likely to be over-stated for reasons explained below.

Table 2: National stock numbers FAOStat

Stock numbers		2011	2012	2013	2014	2015	2016
Cattle		309,000	310,000	312,000	313,000	313,773	304,034
Pigs		146,000	146,400	147,000	147,500	149,203	153,662

Source: FAO Stat (various years). Note these numbers are likely to be heavily over-stated.

FAOStat data records over 30,000 head of cattle slaughtered each year in both the commercial and informal sectors but also records a total national production of 2,000 tonnes which is low giving a carcass weight for just 60-65 kg. The two government abattoirs alone (FMIB) slaughter about 7,000 cattle/year and produce 2,000 tonnes of beef. This is a very accurate figure. The average carcass weight for these cattle (including cull cows and working bullocks) was 285 kg. The beef industry map (see Section 4 based on calculations from the Census 2009) concurs with a turnoff of about 14,000 head (10%) and a tonnage of 4,050.

While FAO data is unreliable, trends in commercial beef production are accurately recorded in the FMIB data (Figure 4). Current slaughter numbers are around 7,000 per year, well down from the 11,000 /year at the turn-of-the-century. Slaughter numbers are disaggregated by class of animal in Figure 5.

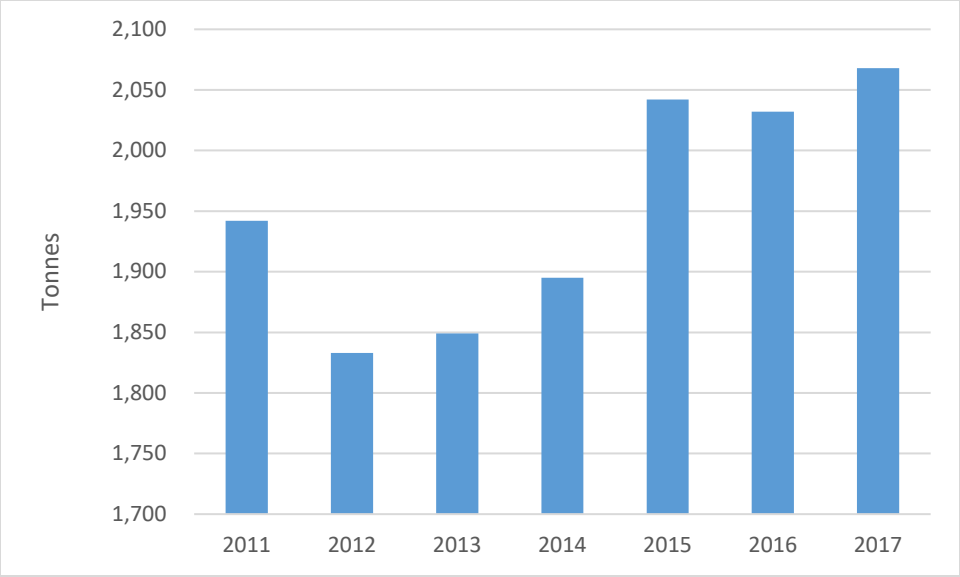

Figure 4: Beef production in FMIB abattoirs tonnes

Source: FMIB Results Pers Com Steven Ting CEO FMIB

Much of the so-called commercial beef is in fact cull working bullocks used in the cane industry and cull dairy cows, as only 10% of registered cattle slaughter is considered “prime” beef. This is reflected in the number of cattle and the total weight of cattle slaughtered through the FMIB facilities.

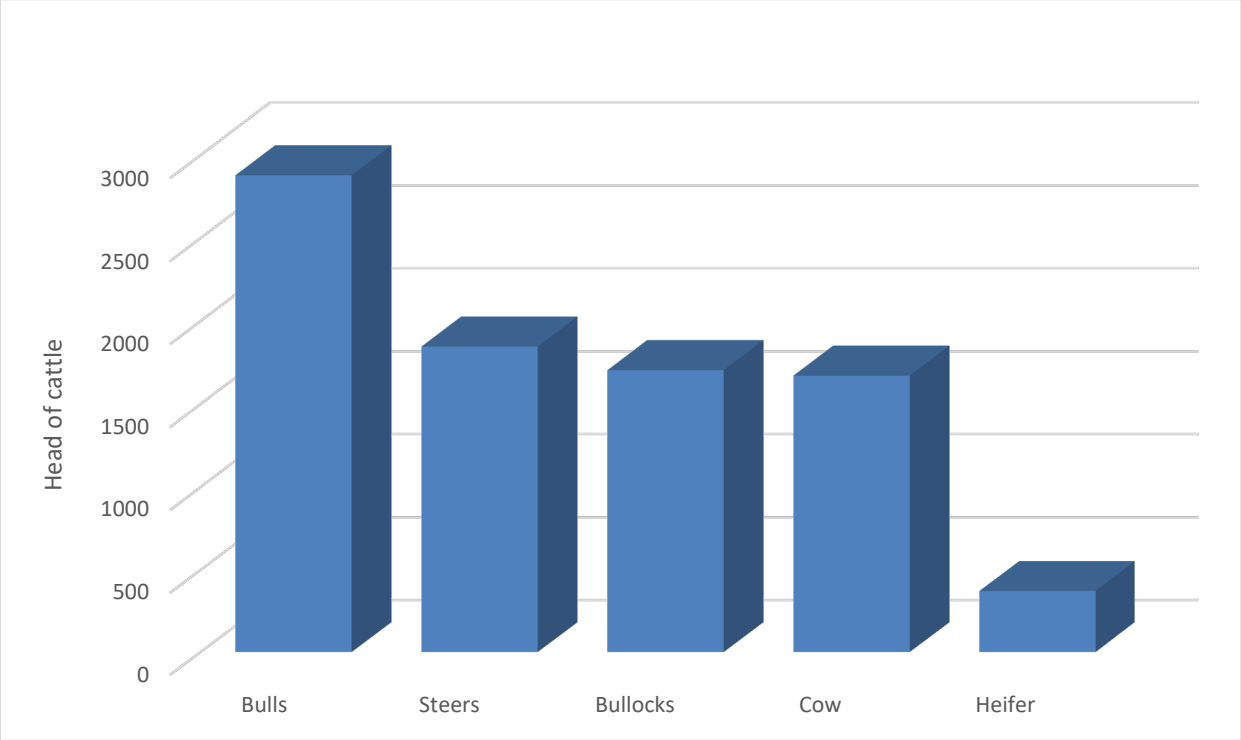

Figure 5: Number of cattle slaughtered by class in FMIB abattoirs

Source: Cole (2016) based on FMIB board papers

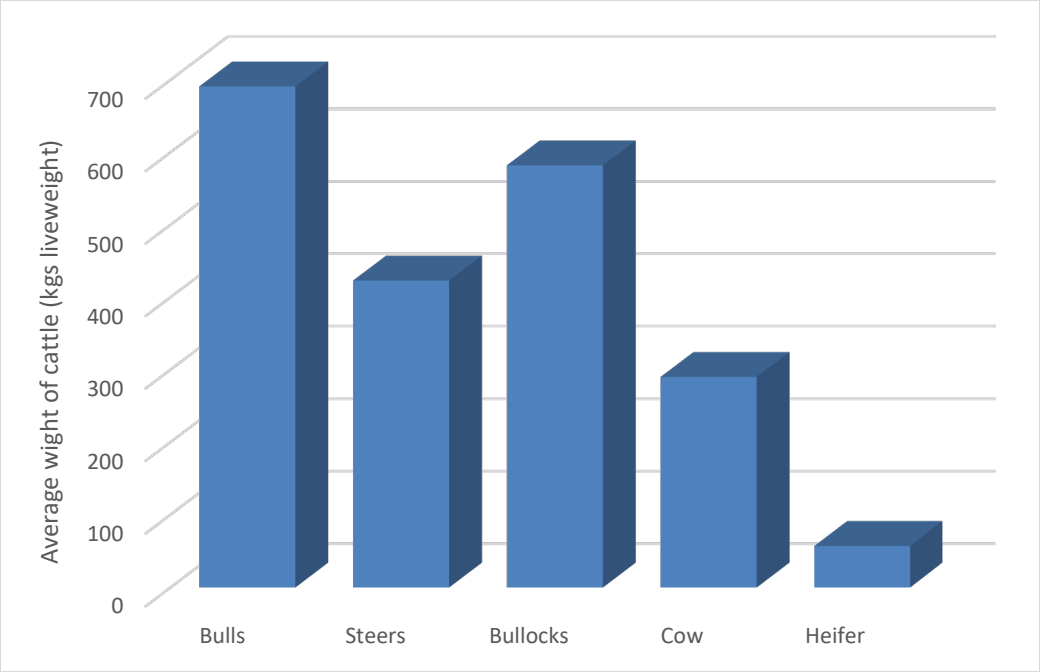

Figure 6: Average weight of cattle slaughtered by class in FMIB abattoirs

Source: Cole (2016) based on FMIB board papers

There is a ban on slaughter of female stock without the approval of the Permanent Secretary of the Ministry of Agriculture (MoA). This is officially enforced but difficult to monitor in the informal sector.

About 78% of cattle are held in small-holder production systems where beef production is of secondary importance to draught animals or house cows, particularly in the cane sector. Dedicated commercial dairy cow production makes up another 14% of production. It is likely that the numbers of cattle recorded in the cane and dairy sectors will decline markedly in the coming 2019 census as more people have either left the cane sector or mechanised production and the dairy sector has been ravaged by TB.

Commercial beef producers of any scale, account for just 8% of all stock. An estimated 83% of cattle are owned by the Fijian community, as the largely ethnic Indian Hindu population do not handle cattle.

3.3 National self-sufficiency in meat production

It is not possible to consider the volumes and self-sufficiency of Fiji's meat sector without accounting for the significant volumes that are produced and consumed in the informal sector, and for processing and re-export.

For pork, domestic production meets 70% to 80% of domestic demand, but when informal production is included, this rises above 95%. Poultry are produced predominantly by the commercial sector and meets more than 90% of domestic demand. Virtually all sheep meat is imported as low-quality imports from much larger commercial systems overseas so local self- sufficiency in sheep meat is very low.

Fiji has a successful corned meat processing industry. All the meat for this production is imported. Therefore, when considering self-sufficiency in the local beef sector, it is necessary to account for the volume of beef that is imported but re-exported in canned meat products. Based on data of total import volumes, domestic supply of beef meets between 35% and 40% of domestic supply but, adjusted for re-

exports, domestic supply meets between 61% and 77% of domestic supply and averages 71% (Table 3). These figures are also used in the calculations in the beef industry map (Section 4**Error! Reference source not found.**).

Table 3: Calculation of self-sufficiency adjusted for re-exports (tonnes)

	2013	2014	2015	2016	2017
All Beef Imports (Net)	1,578	1,951	1,331	2,418	1,623
Local Production	4,544	5,600	4,384	3,776	4,000
Total Supply	6,122	7,551	5,715	6,194	5,623
Self Sufficiency	74%	74%	77%	61%	71%

Source: Author analysis, World Trade Map and FMIB (various years)

4 Industry map

An industry map has been created to identify the different value chains that make up the Fiji beef sector. This was calculated based on statistics from the NAC (2009), the FMIB data (2012), and from local knowledge. The chart estimates volumes and values of different supply channels follows them through processing and finally distributes them into end markets. These FMIB (various years) volumes and values have been multiplied through the value chain to give the final value of each sector of the beef market in Fiji.

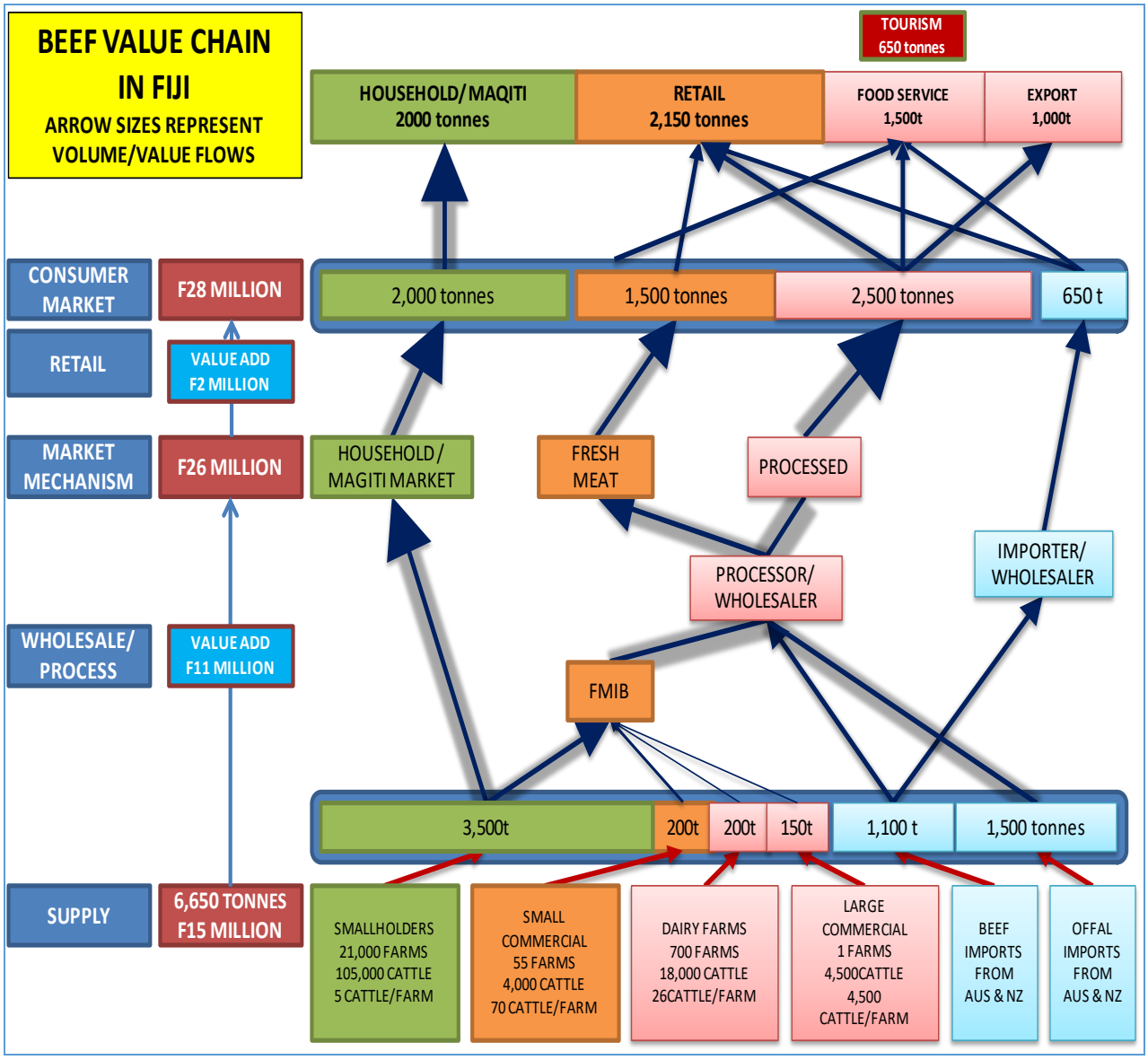

Figure 7: Beef industry value chain map

Source: Cole and Marlow (2012)

The beef sector has been disaggregated into several different segments in Figure 7. The "large commercial farm" refers to Yaqara, which is by far the largest commercial individual beef farm in the country with 4,500 cattle. Medium commercial farms primarily represent the freehold estate farms largely in Vanua Levu and are typified by herds of about 200. These farms often slaughter their own cattle and sell them locally. Small commercial farms sell predominantly through middlemen to butchers via the FMIB. Dairy farms sell the large number of cull cows that enter the beef market as fresh meat sold directly from the farm to butchers via the FMIB.

The largest contributor to local beef production are small-holders. These farms are likely to sell old working bullocks, culled house-cows but very few prime steers. This segment often sells cattle directly into the magiti market or as required by the Muslim community for festivals. They are also the main

supplier to the intermediaries that aggregate this production and transfer it to butchers via the FMIB. To estimate small-holder numbers, the more visible commercial production has been deducted from the numbers in the 2009 census. Small-holders hold an average of five cattle each.

The turnoff rate for Yaqara is assumed to be 15%. A calving percentage of above 50% is assumed reflecting the more extensive production system. Smaller commercial beef farms have a turnoff rate of 20% and a calving rate of around 80%, reflecting more intensive systems. The turnoff rate in dairy beef farms is only 5% as cows are retained for milk production animals. Bobby calves are sold or exchanged for pasture or fence clearing contracts. Calving percentages in the dairy sector are around 50%. The turnoff from small-holders is assumed to be 10% as many of these animals are used as milk cows or draught animals for extended periods prior to slaughter.

Beef from commercial sources represents about 50% of the total beef processed at the FMIB abattoirs. The remaining throughput comes from small holders via intermediaries. The total volume of meat entering the formal markets (through the FMIB abattoirs) is only 50% of total local production by number of cattle. This means that the remaining 50% is sold or exchanged directly into the magiti or festival markets.

A higher proportion of beef (by weight) is likely to flow through informal / magiti markets. Steers slaughtered in FMIB abattoirs are relatively young and small and assumed to be 440kg liveweight, with a dressed weight of 210kg. Dairy cattle are assumed to have smaller weights (400kg liveweight, 200kg dressed), representing the poorer condition and recovery from these animals at slaughter. Working bullocks that are more likely to enter informal markets are, on the other hand, large mature animals which are typically above 300kgs dressed weight, suggesting that there are not many genetic bottlenecks to beef production in Fiji.

The price received at Yaqara and the medium sized farms attracts a premium at around $6.00/kg carcass weight. Given low calving rates and low turnoff rates only about 25 of these cattle enter this market each week across the entire country, for one large butcher in Nadi (South Pacific Butchery). Possibly two small outlets in Vanua Levu can attract sufficient steers that could be regarded as top quality beef. Most commercial butchers do not differentiate between top quality beef and cull beef. Issues of quality in the Fiji market are very different from western interpretations.

Allowing for the re-export of 1,000 tonnes of meat in canned form, imports account for about 50% of the total beef consumption in Fiji. About 50 tonnes of this import is top quality beef for the food service sector while the rest is a mixture of offal's and mechanically deboned meat , by-products from New Zealand and Australia. This product often enters the market exempt from duty as it is used in local processing. It is unlikely that local beef enters the canning chain because it is genuine beef (not grinds and offal) and therefore more expensive.

The $11 million cited (Figure 7) at the "Wholesale and Process" cost represents the actual slaughter value at the FMIB and includes the FMIB fees ($0.37/kg hot carcass weight, hooves off, liver, heart, lungs out, with kidneys and suet in) and a margin for the middleman collection and delivery. The figures taken for the rest of the sector represents the lower transport cost or domestic slaughter value incurred in the magiti sector.

Processing costs have been estimated at FJ$5.00/kg for factory processing and for high value presentation for quality fresh meat. A figure of FJ$3.00 has been taken for lower value markets, some of which enters the magiti market. The magiti market attracts no processing costs.

5 Fiji beef production systems

5.1 Production systems and quality

The quality of beef is directly linked with different production systems. The Fijian beef industry began development under several old coconut estates, particularly in the Northern division. This is often the best quality beef in the country. Yaqara is an extensively grazed dryland farm system which suffers from weed infestation (possibly caused by over stocking) and drought impacting available pastures. This beef too is sold as premium quality though often "rangier" than commercial beef produced in the commercial wetland systems. Two schemes in the intermediate zone (Uluisaivou and Yalavou) both failed for a combination of reasons but were ideally located to produce quality cattle.

Local premium beef is predominantly single suckled and then ranged on tropical quality (36% fibre content) pastures. It may be possible to turn off an animal in three years, but four years is common.

However, the bulk of the industry remains firmly in the orbit of culled dairy cows and working bullocks. This is typically lower quality but there is little local differentiation for high and low "quality" beef.

Cull beef is reared in the dairy sector. Calf rearing in this sector is very poor with mortality rates often above 50%. The cost of calf rearing is expensive, so few farmers retain dairy bull calves for beef. Culls tend to have been production animals for up to 10 years and are often in poor condition at slaughter. Working bullocks, pulling heavy equipment, may be large and well-muscled, but working muscle is, by definition, tough.

5.2 Scale of production data

The National Agricultural Census of 2009 (DoA and FAO, 2009) reports data on the number of farms and stock held by "commercial farms" and "subsistence farms" for both dairy cattle and beef cattle farms. To underline the importance of the dairy sector, the census records 22,551 commercial dairy cattle (which make up 17% of the total cattle herd) and 36,599 head in subsistence dairy production systems (27%), which also contribute to the beef sector as culls. There are 20,355 head held by commercial beef cattle producers (15% of all cattle) and 55,327 head held by subsistence beef cattle producers (41%), which are predominantly working bullocks.

Table 4 provides data for beef producers down to division level. "Commercial farms" are not defined but include four large farms (800-5,000 cattle) and an average scale of production of 19 cattle. "Subsistence farms" are the remainder and have an average scale of five cattle. Beef cattle held on what are classified as "beef farms" (75,682 cattle) account for 56% of the reported herd (133,000), the rest held in dairy (often also cane) farms.

There were reported to be a total of 22,222 cattle and dairy farms in the NAC (2009) holding 134,832 cattle. These numbers are a drastic decline on the statistics reported in the NAC (1991), where there were 42,789 cattle-raising households and 280,221 cattle. That is, cattle farm and cattle numbers declined by about 4% per year over the period.

There were reported to be 1,073 commercial beef farms, mainly located in the Western division. While this sector made up 8% of farm numbers, it accounted for 27% of cattle turned off from beef farms. Analysis in the census reports that there has been a large decline in the commercial herd due to failures at Talavou and Uluisaivou projects and other factors (disease, pastures, growth of the magiti market, and the expiry of land leases).

Table 4: Beef cattle and beef cattle farms classed as commercial and subsistence by Division in Fiji

	Central	Western	Northern	Eastern	Total
Total beef farms	1,796	6,636	4,360	166	12,958
Commercial beef farms					
	209	634	191	39	1,073
% of all farms	12%	10%	4%	23%	8%
Subsistence beef farms					
Number	1,587	6,002	4,169	127	11,885
% of all farms	88%	90%	96%	77%	92%
Total livestock	11,865	40,325	22,826	666	75,682
Beef cattle on commercial farms					
Number	3,197	12,804	4,162	192	20,355
% of all farms	27%	32%	18%	29%	27%
Beef cattle on subsistence farms					
Number	8,668	27,521	18,664	474	55,327
% of all farms	73%	68%	82%	71%	73%

Source: Author analysis based on DoA and FAO (2009)

There were 11,885 subsistence beef farmers, located mainly in the Western and Northern divisions. Subsistence farmers account for 92% of beef farm numbers and 73% of the cattle they produced. The census reports that there has been a very sharp decline in subsistence farmers (from nearly 40,000 in 1991 (although this includes dairy farmers too) due especially to the expiry of land leases, farmers shifting to commercial farming or farmers leaving the industry in favour of other alternatives.

The next census will be conducted in 2019, and future census estimates are likely to be more accurate.

5.3 Small-holder farmers

Small-holder cattle producers operate without the assistance of any service providers but occasionally call on the services of Ministry of Agriculture extension officers. If veterinary drugs are required, they are sourced through the ministry and only administered by a MoA extension officer.

Husbandry skills are negligible with few cattle being castrated, rotated around pastures, or medicated in any way feasible.

About half the number of cattle produced at small-holder level are sold or used for direct consumption at household level and for festive occasions. The other half are purchased by Muslim middlemen who collect animals to trade to wholesalers and processors in the formal market.

Intermediaries act as traders in the market rather than agents. They buy, paying cash at the farm gate, and may hold animals to ameliorate supply issues. A small number of cattle are now supplied directly to the FMIB who have moved beyond their historical role as a service provider and now compete as a cattle buyer and meat seller with the industry it serves.

Due to the small number of livestock traded into the formal meat sector (around 7,000 head per year) there are no livestock markets in Fiji. Intermediaries comb countrywide to source cattle.

The characteristics of the small-holders:

- Hold 105,000 cattle (over 75% of the cattle population) on 21,000 farms with an average of fivecattle per farm;
- These cattle are held at the farm level, under managed, and are tethered and graze on available pasture. They are produced on the principle of low input/low output farming;
- These cattle can also provide traction (working bullocks) and some dairy products (cows);
- Genetically the animals can achieve a large body size. FMIC data suggests that the average carcass weight of working bullocks is 345 kg, and for steers is 267 kg
- These factors combine to provide an estimate that the small-holder sector produces over 50% of the beef required by the market (including exports).

5.4 Medium commercial farmers

Medium-sized farms, particularly cattle raised on the old coconut plantations of Vanua Levu, are currently the focus of the Ministries extension efforts. These farms typically produce the best quality beef in the country as they are well managed as farming businesses and exist in the intermediate zone with reasonable access to pastures year-round. The Ministry of agriculture is trying to develop these farms as multipliers. Focusing on this frontier of intensification with improved management is a sensible policy.
This production system does not have a parallel on Viti Levu although the now defunct programs at Uluisaivou, Yalavou, and Tilivalevu would be a direct comparison.

There are estimated to be 4,000 cattle (3% of the population) on 55 farms with an average of 70 cattle/farm and estimated to produce 200 tonnes of beef/annum (Cole and Marlow, 2012).

Commercial farmers also depend on the Ministry of Agriculture for veterinary drugs. In some cases, the MoA has allowed drugs to be held on farm. Well managed commercial farms achieve calving percentages up to 80% and are likely to include improved pasture species and enough paddocks to properly manage a stock rotation system. Castration bullocks will be commonplace. Turnoff of cattle is likely to be closer to 3 years. Many of these estates in the Northern division have access to their own slaughter houses and commercial market outlets within the local community.

5.5 Yaqara

There is only one large cattle enterprise in Fiji, called Yaqara Station. This enterprise has 4,500 cattle and is estimated to produce around 150 tonnes of beef per year (600 cattle at 250 kg carcass weight). Yaqara produces good quality, steer beef under 36 months and has a supply arrangement with South Pacific Butchery. South Pacific extracts quality grilling cuts from the Yaqara cattle for sale into the hotel and resort sector (particularly Denarau).

Husbandry skills and stock rotation including splitting herd into production groups is practiced. Access to medication is on farm.

5.6 Beef in the cane sector

There are strong links between beef and cane sectors, within in the Western and Northern divisions (Map xx). A large majority of cane farmers hold a few (two or three) cattle to provide milk (from cows) and draught (working bullocks). Animals are used for draught from about 1.5 years old, often until they are mature and heavy. Cattle are periodically sold and supply the market with (tough) beef. The preferred livestock for farmers in cane growing areas are goats and cattle, in large part due to the predominance of Hindu farmers in cane growing areas as well as a shortage of sheep. While cattle are still used for cultivation and transport in hilly areas, flat low-lying areas are becoming more mechanised. Farmers can hire tractor (services) from the government, for a range of uses, for around $28/hour ($45 to $50 in the private sector).

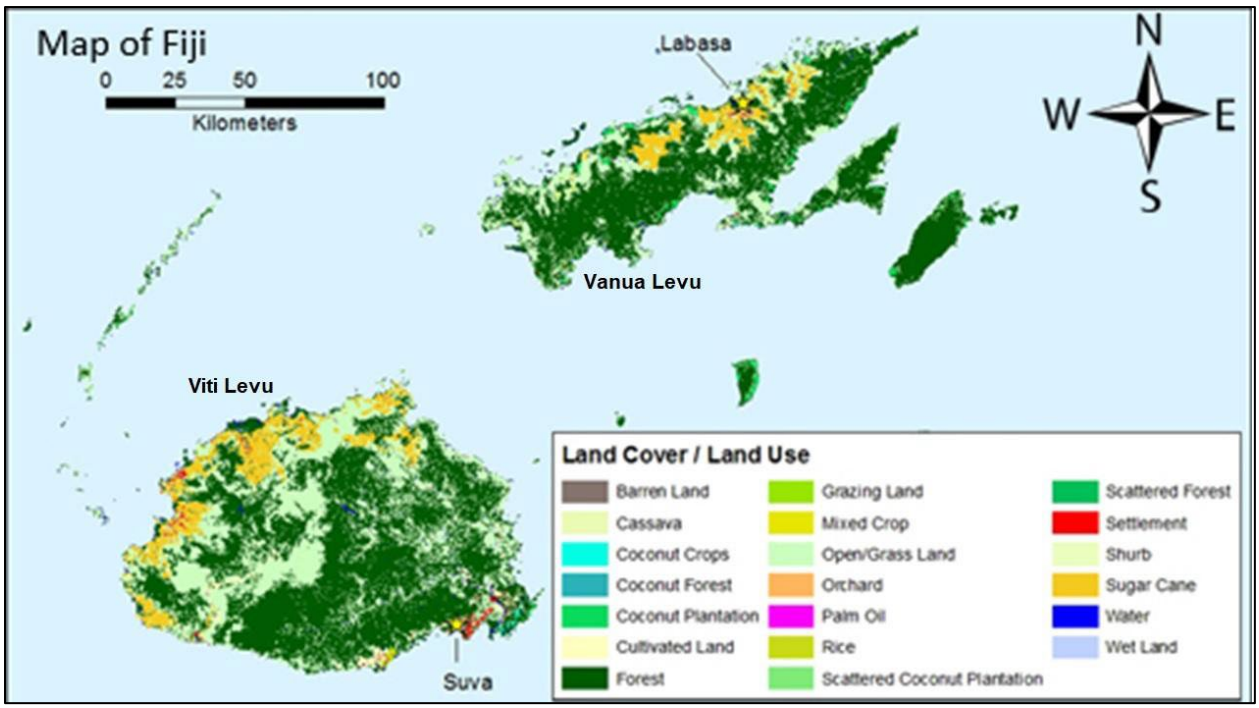

Figure 8. Agricultural land use in Fiji

Source: Tiwari et al. (2018) drawing on data from the Ministry of Land and Mineral Resources

There can be long delays in payments from sales of sugar. Fijian farmers no longer have preferential access to EU sugar markets. Income from other sources, small or large livestock and dairy, are therefore important for cash flow.

The Fiji Sugar Company is determined to re-develop the sugar sector and will only consider complimentary and supplementary farming activities. The conservative nature and religious persuasions of ethnic Hindu Indian cane farmers further constrain substitution between cane and cattle.

Cattle in the Cane sector typically derive a major source of their nutrition in the dry season by following the cane cutting gangs and grazing the cut cane tops at each farm in rotation. Cattle nutrition could be improved by ration formulation of sugar by-products (cane tops, molasses, rice straw) with protein sources (copra meal, brewers grain, cassava tops), but the cost and logistics require investigation.

5.7 Beef in the dairy sector

Beef is also produced from dairy farms as a by-product of milk production. Male calves are either slaughtered young as bobby veal (often exchanged for contract pasture or fencing work) or occasionally grown out to provide beef carcasses. On dairy operations there are 18,000 cattle on 700 farms and in combination they are estimated to produce 200 tonnes beef/annum.

As an indication of the size of the dairy industry, the Fiji Co-operative Dairy Company Ltd (FCDCL) has about 280 members, with about 16,000 milking cows (now reduced to 10,000 due to TB) with a wide range of herd sizes. The Dairy Co-op provides advisory service equipment, feed, improved genetics/breeding services to farmers.

The dairy industry has been ravaged by TB and testing is now spreading to the beef sector which is less likely to be impacted as cattle are more widespread and are not herded together twice a day for milking.

Small dairy farmers in the cane belt are typically families. Milk is used widely for home consumption and occasionally processed to ghee. The MoA encourage collection and sale of milk into the formal market through collection centres in Ba and Lautoka. Farmers milk cattle, often by hand, for roadside collection by contracted collectors. Prices are around $0.8 per litre and some farmers can supply 10 litres per day. The economic viability of this is questionable due to the long distance to ship small volumes of milk to the processing factory.

These dairy or dairy/beef farms produce cattle (male calves, bulls, culled cows or steers) that enter the beef market. There are some estimates that 50-60% of FMIB throughput is linked to the dairy/draught cattle industry, although this may have increased (up to 80% 2018) with the cull of TB reactors.

Production practices on dairy farms are variable, but can include pasture improvement, rotation, and supplementary feeding (copra meal and meal mix). Potential exists to apply improved practices, including feeding, weaning and castration, to improve beef production.

5.8 Tuberculosis

The Fiji dairy industry has been devastated by TB. Up to 40% of the dairy cattle have been classed as reactors and sold immediately for slaughter according to the Fiji Brucellosis and Tuberculosis Eradication Committee). Testing for TB in the beef sector has only just started with a low number of infected animals reported thought to be the result of less (transmission) of cattle in the beef sector.

The number of reactor cattle should now start to decline but the outbreak is likely to last for another five years at least. Beef cattle have been less impacted by TB because of the lower stocking densities and the fact that they are not mustered twice daily. The result of this disease impact is that the cull beef market has been oversupplied and it is very difficult for some farms to find outlets for their cattle. This is exacerbated by the backup and overstocking of cull cows at Yaqara.

It was previously believed that TB was constrained to Central and Western divisions. However, in 2018, 60 reactors were identified and removed from Northern division coconut plantations. Whilst small in

number, it suggests further breakdown of controls in more extensive systems. Some animals have been removed, but more testing is required, based on a testing protocol. Whilst compensation is paid for condemned dairy cattle, there is no such scheme for the beef industry.

The confirmation of a positive test and a beef farm means that no clean cattle can be transferred from that farm to another farm or sold into the ceremonial (magiti) market. Reactors can be sold directly to the abattoir for slaughter and sale but, as discussed above, this market is now oversupplied. It takes three clear tests and a period of nine months, to allow the cattle to be sold again. This whole process basically prohibits the farmer from selling cattle to traditional markets for the period of the year.

Fiji has a *Disease Control and Surveillance Act* and has long had a Brucellosis and Tuberculosis Eradication and Control (BTEC) program. However, surveillance may have lapsed in recent decades which led the current crisis and measures. In 2018, the Minister of Economics approved $2.8 million funds to support the BTEC program. Coordination between the MoA and Biosecurity is now well established.

5.9 Productivity

It is difficult to determine the efficiencies of most of the beef industry due to its extensive and unstructured nature, no central marketing, lack for management records and the fact that most of the local beef is a by-product from another livestock sector. However, the NAC (2009) report on the herd structures in Fiji which enable derived productivity indicators are shown in

Table 5.

Table 5: Derived production indicators for four provinces in Fiji, 2009

Province / National	% Cows >3yo in herd	Calving rate (% calves <1 year to cows >3 years)	Bull to cow ratio
Central	30%	72%	3.8
Western	30%	58%	4.8
Northern	27%	50%	2.1
Eastern	14%	135%	1.1
Fiji	29%	59%	3.7

Source: Derived from DoA and FAO, 2009

The derived calving rates appear to be high. Small-holders typically have a calving rate of around 40%, although commercial farms like Yaqara have rates closer to 60% and commercial estates can be higher. Very high rates are recorded in the Eastern division, where there are very low cattle numbers, and young cattle may be transported in.

Mortality rates are low, but there are high losses to theft of growing stock.

Steers are sold at the age of three and four years, but significantly higher for draught animals and culled cows. This indicates growth rates of between 0.3 to 0.4 kg/day based on tropical pastures. There is no supplementary feeding in the beef industry.

Macro data from the NAC (2009) (of 115,000 cattle) and a turnoff of 20,500 (Section 4) suggests a turnoff in the vicinity of 15%, which is very low, partly because of the cane – draught systems.

6 Industry support

6.1 Policy settings

Based on its own assessment of the available data, the Department of Animal Health and Production (DAHP) described Fiji's beef policy, which is also outlined in the Livestock Sector Strategy, as follows:

> *"Fiji is 48% self-sufficient in beef and aims to replace a substantial part of the remaining 52%"*

The magiti market can be serviced form local production, but they hope to replace some of the imported beef entering the hotel and restaurant market. This requires an increase in quality (and quantity).

It is unlikely Fiji will ever produce enough low-quality product to enter the canning trade as all Fiji beef can find a local outlet in higher value markets.

Part of the response is breed improvement. Fiji is concerned about introducing breeding stock with diseases (Blue Tongue from Australia and Mycoplasma and Theileria from New Zealand), so it has adopted a breeding strategy based on AI and ET. The department is conscious of the need for improved nutrition (and has released new varieties including Mulatu II, juncao) but is also conscious of the limited research and extension in the field.

The department believes that improved production and output is most likely to be achieved through medium and large farmers, with possible spill-over effects form smaller farmers. About 20-30 farmers are targeted through the Beef Multiplication Project that meet criteria (including 50-100 acres, 20+ breeding

cows). Much of the emphasis is on farm and infrastructure improvement (fences, pastures, clearing, water). The MoA monitors the farms.

Other areas of particular interest to beef policy described below is:

- The BTEC program;
- Abattoir upgrading; and
- Policy toward related sectors – sugar cane and dairy.

6.2 Extension

Historically, Government, particularly through international aid schemes, has strongly supported the commercial beef sector, to utilize vacant pasture lands and reduce dependence on imports. These schemes include Verata, Tilivalevu, Yalavou, Uluisaivou and Yaqara. Only Yaqara has survived, largely because of an annual lease payment from Fiji Water. In recent years, with good management, the farm has become profitable in its own right.

Extension services are largely ineffective at developing the sector. Subsidisation of the sugarcane sector resulted in mono-cropping which, together with mechanisation, has seen a reduction in livestock production. Current extension services do not have enough capacity to deal with this evolving situation. Many farms based on the NAC 2009 indicated that they had not been visited by extension officers. Possibly as a result of a lack of a dedicated extension service for the beef sector, the adoption rate of new technologies is low. This data was reported in the Fiji Livestock Sector Strategy.

Table 6. Indicators of technology adoption in the Fiji beef industry

Technology	**Percentage of Total Farmers with new technology**
New pasture varieties	11.4%
New livestock breeds	2.8%
Practicing organics	8.4%
Requesting loan financing	6.0%

Source: Livestock Sector Strategy Working Group and Ministry of Agriculture (2016)

Every administrative division has one or two livestock officers, which is fewer than for horticulture/crops. The NAC (DoA and FAO 2009) reported that only 28% of farmers were visited by extension staff, and 20% had been on field visits. These statistics, based on the NAC (2009) are also cited in documents to support the national livestock strategy. More staff are required. The DAHP have recently created five new animal health positions (with some yet to be filled).

Current government extension efforts are focused on reviving the Yalavou beef scheme near Sigatoka. Support includes re-establishing the original (1980s) schemes, stockyard infrastructure pasture and fencing owned by government.

In the North, the government is working on pasture development schemes including the release of a new pasture varieties Mulato. Mulato II was developed at CIAT from two brachiaria species *B. ruziziensis* x *B. decumbens*, followed by two generations of hybridisation by exposure to *B. brizantha* pollen in the field and was released in 2004.

The government has also established a number of multiplier farms to improve stock quality in the North based on Limousins crossed with local stock.

The government is also working to encourage the marketing of beef from the North through a private butcher, taking advantage of the change in the Meat Act Cap 137 1985, which allows meat slaughtered in the Northern division slaughter houses to enter the main markets on Viti Levu. In the Western division, the MoA have four dairy extension officers that also assist with beef cattle. The department also supervises farmers, through the collection of data, which is recorded by province in quarterly reports. These were said to cover a large proportion of all farmers.

6.3 Research stations

The Sigotoka research station conducts research on beef including:

- Breeding. In the past, the station bred and distributed breeding bulls to selected farmers. Have now established an embryo transplant program (Senepol, Swiss Brown and Droughtmaster genetics). There is also a bull station (Waindradra Nawaicoba);
- Pastures (signal, mulato II, and juncao) and legumes (leucaena, arachis pintoii, siratro); and
- Rations and silage (molasses, copra, mill run, crushed wheat).

The station also conducts some training, directly and through the MoA, with training modules on pastures, management, castration and other relevant topics.

6.4 EDF 11

A livestock strategy was developed in line with the requirements for funding under the EDF 11 program. To date no funds have been released from this program. The EDF program is a successor to cane industry support to Fiji and activities focus on the sugar areas in the west of the main islands.

The livestock strategy is a multi-sectoral document which focuses on improved governance, competitiveness in value chains, sustainability and risk management, and new generation opportunities. Funding under the EDF 11 program will be provided a budget support to government who will essentially decide where these funds are spent.

6.5 Bilateral assistance

Australia (Australian Reproductive Technology) provides support to improve the genetic potential of Fiji cattle. Programs of ET and the introduction of Brown Swiss cattle form part of this program. There are no other bilateral programs operating specifically in the beef sector at this time.

6.6 Regulatory environment

The MoA operates under the legal ambit of more than thirty laws and regulations that govern the agriculture sector of Fiji. The need to review these laws has been prioritized by the Ministry, to facilitate changes, harmonise related rules and regulations, and provide the dynamics required for sustainable growth and development of Fiji's agriculture sector.

The Facilitation Committee for Agriculture has therefore proposed a review of agricultural laws, to identify redundancies, conflicts, and duplication within the legislation and propose improved ways forward. This process however is currently stalled. Current legislation that impact on the beef industry include:

- *Agricultural Land and Tenant Act* (Cap.270)
- *Animals (Control of Experiment) Act* (Cap.161)
- *Birds and Games Protection Act* (Cap.170)
- *Brands Act* (Cap.163)
- *Cooperative Dairy Companies Act* (Cap.119)
- *Crop Lien Act* (Cap.226)
- *Dairies Act* (Cap.118)
- *Drainage Act* (Cap.143)
- *Fencing Act* (Cap.167)
- *Goat (Ear marks) Act* (Cap.164)
- *Irrigation Act* (Cap.144A)
- *Land Conservation and Improvement Act* (Cap.141)
- *Meat Industry Act* (Cap.137)
- *Pesticide Act* (Cap.157)
- *Pound Act* (Cap. 165)
- *Promulgation of Biosecurity Act* 2008
- *Protection of Animal Act* (Cap.169)
- *Stock Improvement Act* (Cap.162)
- *Trespass of Animal Act* (Cap.166)
- *Veterinary Surgeons Act* (Cap.257)

The proposed *Animal Feeds Act* has been much discussed by the industry but is yet to be introduced. It is expected to have little impact on the beef sector. The Food Safety Act 2003[3] and regulations (2009) introduced in the last five years attempt to improve the quality and traceability of meat in local markets through the introduction and application of asset standards. It is intended that these standards will eventually be applied right down to the farm level, but at this point in time they have been only been introduced into the larger processing and retail outlets, including the FMIB.

6.7 Duty regime for imports

The beef industry is protected with a duty rate of 15%, with offal surprisingly attracting a 32% duty. It is not clear if local manufacturers processing imported meat for re-export get a concession from this rate.

Table 7: Customs rates on beef imports

Product	Duty Rate %	HS Product Code
Carcass	15	0201 10
Cuts	15	0202 20 / 30
Offal	32	0206
Salted Meat Meals	15	0210 20
Meat Preps Canned	32	1601 / 1602

Source: Fiji Customs (2019)

[3] Food Safety Act 2003 and Regulations 2009 http://extwprlegs1.fao.org/docs/pdf/fij50969.pdf

6.8 Commodity associations and industry bodies

There is a Grazing Association based in the North, a member of the Fiji Crop and Livestock Council, which includes sheep and goats. The Association enables farmers to raise issues with Government.

6.9 Trade agreements

Fiji belongs to the Melanesian Spearhead Group (MSG), which has a trade agreement aimed at reducing tariff rates between the Melanesian nations. Export trade in beef is focused solely on Vanuatu which exports considerable quantities to both the Solomon Islands and Papua New Guinea. Fiji does not produce sufficient quantity or quality of beef for export. Biosecurity regulations are of course important in trade agreements.

6.10 Training

The National University of Fiji, formerly the Fiji Agricultural College, has dedicated agricultural courses including practical attachments for students. There are no specific beef courses as agriculture training is inclusive of all crop and livestock enterprises. The University of the South Pacific also provides degree courses at the Alafua campus with an emphasis on training government officers in administration, policy, and trade.

6.11 Agricultural infrastructure and ownership

Agricultural infrastructure including facilities for market access are mostly public investments. Investment in rural transport infrastructure has been financed by government with assistance from donor agencies. Small farms rarely have basic stockyards. Downstream value adding facilities are mostly in the private sector (the exception being the FMIB's butchery).

6.12 Transport and marketing

There is a well-developed and efficient network of cattle buyers who comb the rural areas to identify stock for sale. These middlemen operate their own transport vehicles and pay cash at the farm gate for any cattle taken. This means the farmer, who is typically selling a small number of cattle, knows exactly what they are getting for the animal and does not have to wait for a payments or weights through abattoirs.

The cost of hiring a truck from remote areas can cost as much as $130 per animal even when there is a full load of 10.

There is no regular market reporting service for farmers. The Fiji Crop and Livestock Association attempted to indicate movements in local and international beef prices but this was discontinued.

6.13 Genetics and artificial insemination

The majority of the local beef is derived from old cull cows that are derived from non-beef breeds. The premium beef market is strongly influenced by Santa Gertrudus with some Limousin and *Bos indicus* breeds. Considerable effort has been spent on improved genetics and Yaqara is the repository of improved beef breeds. Further imports of new genetic material would be beneficial but the impact of AI on this sector will be very slow.

With the assistance of the Australian government, Fiji has introduced ET as a means of improving the genetic quality of stock. Breeds that are being introduced include Senepol, Drought Master and Swiss Brown.

6.14 Input providers

Although livestock feed, veterinary, and equipment companies occasionally visit Fiji and could supply larger commercial farms, this has not materialised. Support to the subsistence sector is even less common.

The DAPH is the main source of veterinary products, which are under the control of livestock extension officers. Access to farms is difficult as delivery often requires significant transport costs.

6.15 Access to finance

Historically the main credit agency relevant to the agricultural sector is the Fiji Development Bank (FDB). The FDB describes its role as catalysing growth and economic development. Agriculture comprises 30% of FDB's overall lending, with livestock agriculture and small to medium enterprise (SME) loans designed for individuals and small farmers. The loan product range for livestock farming includes the purchase of livestock, farm purchase costs, farm development costs, and other agricultural projects. Poultry makes up 60% of the portfolio with cattle and dairy at 30%. Loans have terms from between 8 to 15 years, with a maximum loan of $50,000 based on debt serviceability. Repayments and security requirements are flexible and can include a crop lien, a lien on machinery and other equipment. The MoA is often used to conduct risk assessments and help the bank develop appropriate and more flexible loan products.

The FDB has been involved in many livestock schemes at the behest of the government and to its own expense there have been many losses. FDB lacks technical staff and therefore relies on the MoA for technical support for the approval of any loan facilities. This process is often too long and complex for farmers.

The FDB is currently carrying previous debts from Yalavou, a scheme set up by the New Zealand government. Roads, yards, fencing, pastures, housing, and central administration buildings were all constructed under the project. The FDB was used to finance individual loans for farmers that were translocated from their coastal villages to the interior. Problems occurred when cattle, that should have been sold through the central marketing system to allow for the deduction of loan payments, were "side sold" directly into the industry and FDB repayments went unpaid. Similar experiences occurred at Verata and Tilivalevu.

An identified social problem was that new farmers were never comfortable living in isolated inland areas and many returned to their villages. The scheme was abandoned around 20 years ago, with FDB holding the debts. Interestingly, it is the children of the original farmers who are often brought up on the farm and never knew the villages that are interested in returning to the properties and restarting beef farming and the government is supporting this initiative.

There has been a sharp decline in agricultural lending, particularly in the cane sector but also reflected in the livestock sector, with none of the commercial banks financing agriculture. Commercial banks are unlikely to loan to beef cattle farms due to long return on investment and informal markets. Raising of cattle in the informal sector often takes place on reserve land (no formal lease), which does not allow a farmer to offer any security for his loan period

High liquidity in the banks and an instruction from government that all banks will hold a 6% agricultural portfolio has not resulted in an increased take-up in loans. Loans for small farmers are heavily subsidised with concessional rates at 2%. However, the bank's refusal to accept livestock as security, as opposed to a lien taken over sugar or tobacco crops, hampers financing in the beef sector. The FDB is currently developing an unsecured loan product to cater for farmers.

6.16 Access to land

Most farmers are not of sufficient size to be commercially viable as livestock farmers alone. Nearly half (44%) the number of farms are less than 1 Ha in size, with an additional 35% less than 5 Ha in size. Only 19% of holdings could be described as medium sized or larger and would allow some development of beef production. It is estimated that only 0.2% of farms are over 100 Ha in size (NAC, 2009).

In addition, less than 10% of land in Fiji is privately owned. The control of native lands is vested with the iTaukei Land Trust Board (TLTB). The TLTB facilitates the leasing of native land and distributes funds but it does not operate or develop land in its own right. Constraints include applicants not meeting requirements, illegal dealings with landowners, non-compliance with leases, land disputes, poor infrastructure, and lack of enforcement among stakeholders.

Part of the issue is also a lack of awareness by landowners to opportunities to increase lease revenue and more profitably manage land estates. There is very little training in corporate agribusiness.

7 Pasture and weeds and supplementary feeds

7.1 Pastures

Fiji pastures are characterised by the tropical environment in which they grow.[4] They need to grow fast to out compete weeds. Fast growth relies on laying down high quantities of cellulose enclosing large volumes of water. Even improved pastures (para and seteria) are no quality match for the grass types in temperate regions. These pastures are not energy or protein dense and contain large percentages of fibre. Other improved pastures in the wetter areas include batiki blue and Koronivia.

Improved pastures in the dryer areas include signal grass, which appears to be a strong competitive species and Nadi blue grass known for its drought resistance. Another recently introduced species is mulato II. Much of the beef industry is informally grazed on vacant unimproved land and cane tops during the harvesting season.

Peripheral to other industries no real focus is placed on pasture development in the beef sector, although Yaqara and the Northern division estates do include improved species.

The nutritional value of Nadi blue grass (or any other selected grass species) depends greatly on the fertility of the soil (especially available nitrogen) and the season or phase of growth. Young green leaf of Nadi blue grass is highly nutritious (60% digestibility) but digestibility declines during the dry season

[4] This section draws heavily on an unpublished report by Ian Partridge and Phil Rolston, commissioned by Yaqara Pastoral Company (Partidge and Rolson, 2015).

especially once the grass goes into flower. Although Nadi blue has poor dry season growth, the seed stalks remain soft and edible, unlike the thick woody stems of most native grasses or of mission grass.

Suitable species for the dry areas include guinea grass (*Panicum maximum*) and signal grass (*Brachiaria decumbens*). Signal grass seed from Australia is relatively cheap, but is nitrogen-hungry, and without fertiliser may decline with time. It does not combine well with legumes except for hetero (*Desmodium heterophyllum*) which is common in most parts of Fiji. *Alysicarpus vaginalis* seems hardier. For hetero to combine with signal grass, the grass must be kept grazed. If ungrazed, it becomes decumbent (falls over), smothering the legume.

Guinea grass is seen everywhere across western Viti Levu – along roadsides and in abandoned cane fields. It is highly palatable but may need slashing occasionally if the clumps become too large. Guinea grass combines well with creeping legumes such as Siratro (*Macroptilium atropurpureum*) and centro (*Centrosema pubescens*). These mixtures are commonly seen along the roadsides.

Vaivai stands have remained highly productive for 30+ years. Natural stands of vaivai in Fiji are of a native common variety that can form dense thickets of tall thin stems. Leucaena has thus become regarded as an undesirable weed by conservationists. Leucaena seed is sown in rows 3-4 m apart, closer in areas of higher rainfall, and grass can be planted between the rows.

7.2 Weeds and weed control

Navua sedge is a pervasive weed of all pastures in the wetter sides of the islands. Navua Sedge is a vigorous grass-like, perennial sedge which grows to 30-70 cm in height. It is extremely aggressive and can form dense stands that can smother many tropical pasture species.

Navua sedge is unpalatable and provides little feed value for cattle. If pastures are overgrazed, the weed can quickly take over. Spread occurs through the normal extension of the rhizome system, by seed and by dispersal of viable rhizome fragments during cultivation. The seeds can germinate at any time of the year and the seed heads on each shoot generally produce about 250 seeds each. Seed production per hectare is extremely high with estimates well in excess of 200 million seeds. Seed is viable for five years, so producers can have five years of sedge weed problems if plants mature and produce viable seed.

The dispersal of seed can occur in many ways including through the digestive system of animals and birds, and by being transported in mud on hooves, footwear, flood or running water or machinery and/or vehicles. Seedlings develop quickly from seed and flower in just 10 weeks after emergence.

Kau moce (*Cassia tora*) is a non-nodulating legume and is also known as foetid cassia because of its unpleasant smell. Leaf is totally unpalatable to cattle when fresh, but cattle may eat and distribute ripe seed pods. Cassia seeds can cause uterine contractions and abortions.

Once clear of the associated woody bushes, kau moce can be slashed with a tractor-mounted slasher (with chains or blades) when it reaches a slashable height and before it flowers. The rhomboidal seeds are plentiful and hard seed will remain in the ground for several years, requiring repetitive slashing. Slashing at this stage (early to mid-wet season) will allow the blue grass underneath to grow and strengthen if it is not grazed heavily.

Sicklepod and sennas are unpalatable to domestic stock. However, cattle and horses will eat mature seed, which can pass through the animal and germinate in dung. This is the most common manner of seed spread from one property to another.

Areas of dense trees of prickly bushes (ziziphus and acacia) are other perennial weed species prevalent in pastures. Once established they require clearing by rooting out the plants with a dozer or wheeled tractor and suitable blade. Even at medium densities, it halves the primary productivity of grasslands, interferes with stock mustering, and restricts stock access to water. Control costs considerably outweigh its benefits as a shade tree and drought fodder. Prickly acacia dramatically alters the ecological balance of grasslands and thereby threatens biodiversity.

Guava is a large shrub or small tree up to 6 m tall with smooth, pale brown trunk and shoots covered with thick, fine hairs when young. Hairless oval leaves (40-80 x 25-45 mm) are in opposite pairs on the stem, glossy and dark green above, and dotted with glands beneath. Solitary white flowers produce berry-like fruits (to 2 cm diameter). Each fruit contains numerous seeds. The massive seeding ability it forms dense or pure stands in open area and under bush canopy. Seeds are spread by birds, pigs, and other livestock. Guava tolerates shade, heat, high to moderately low rainfall, wind, and salt.

Control of weeds in pastures used for beef cattle is difficult. Individual woody weeds could be rooted out with a blade on a dozer or wheeled tractor, and then piled up for burning. Woody weeds can be cut by hand with chemicals drilled into the stump to encourage the intake of chemical to the roots, however this method leaves stumps that can puncture tractor tyres. Fallen brush makes mustering cattle or controlling weeds, like *Cassia tora,* by slashing almost impossible.

7.3 Concentrate feeding

Supplementary feeding is expensive and requires management control and infrastructure but, managed properly, can increase returns for farmers. Available products include coconut meal, mill mix, and molasses. Urea molasses blocks can also be used to increase protein intake. Some feed lot trials have been attempted but have not continued, most likely because of the poor quality of calves introduced to the feedlot system. Conservative Fijian dairy farmers are reluctant to invest unless they can identify rapid returns.

Fiji possibly has an opportunity to develop and utilize a low-cost feed ration based on local feed materials such as cane tops and molasses, mixed with chicken litter from the large and rapidly growing domestic poultry sector. There clearly seems to be an opportunity for Fiji to produce:

- Good quality beef from young (less than 4 teeth) steer cattle;
- Produced on farm and grown to about 350 kg liveweight;
- Short feed on a ration of cane tops, chicken litter and molasses for around 90 days; and
- Producing a quality tender beef from a carcass weight around 225 kg carcass weight.

At this stage there is little experience of this model in Fiji. FMIB attempted to feed cattle but failed to achieve viable growth rates due to inadequate cattle management experience.

8 Meat and beef trade

8.1 All meat imports

By far the largest volume of meat imported is sheep meat (Figure 9). Beef including fresh, frozen, and beef offal would be the second largest volume of meat imports.

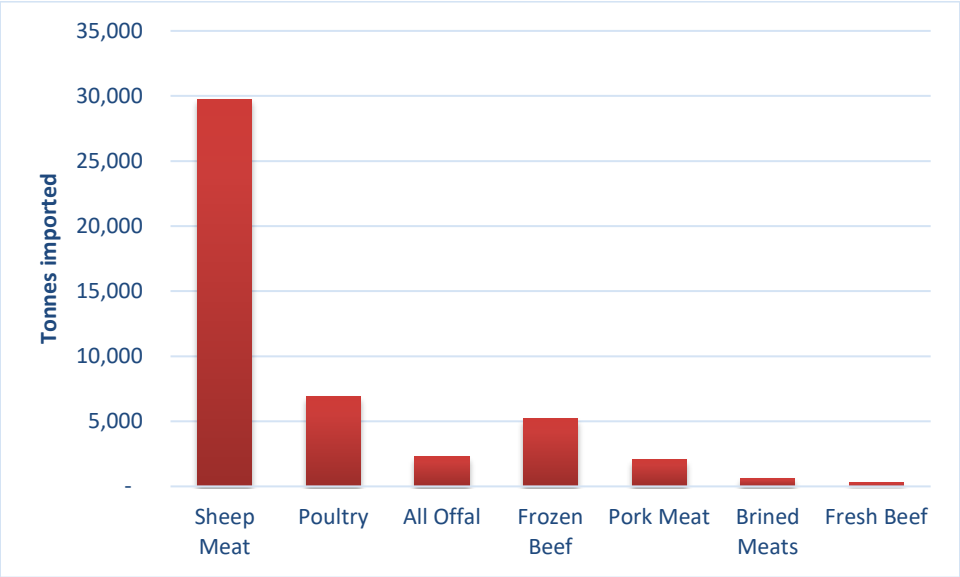

Figure 9: All meat imports Fiji

Source: World Trade Map (2017)

The volume of meat imported is mirrored by the value per kg of the product, with Fiji importing higher volumes of lower value produce (Figures 9 and 10). Sheep meat predominates despite a higher price as it is the only red meat that is religiously acceptable to all races in Fiji and has long established markets.

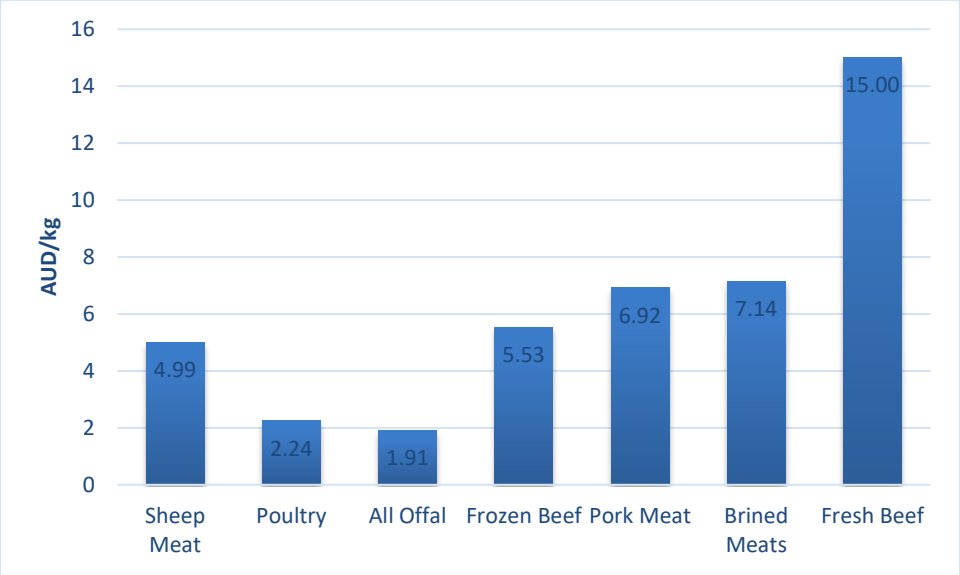

Figure 10: All meat imports by price (AU$/kg)

Source: World Trade Map2017

Self-sufficiency in all meat products is graphically shown in Figure 11.

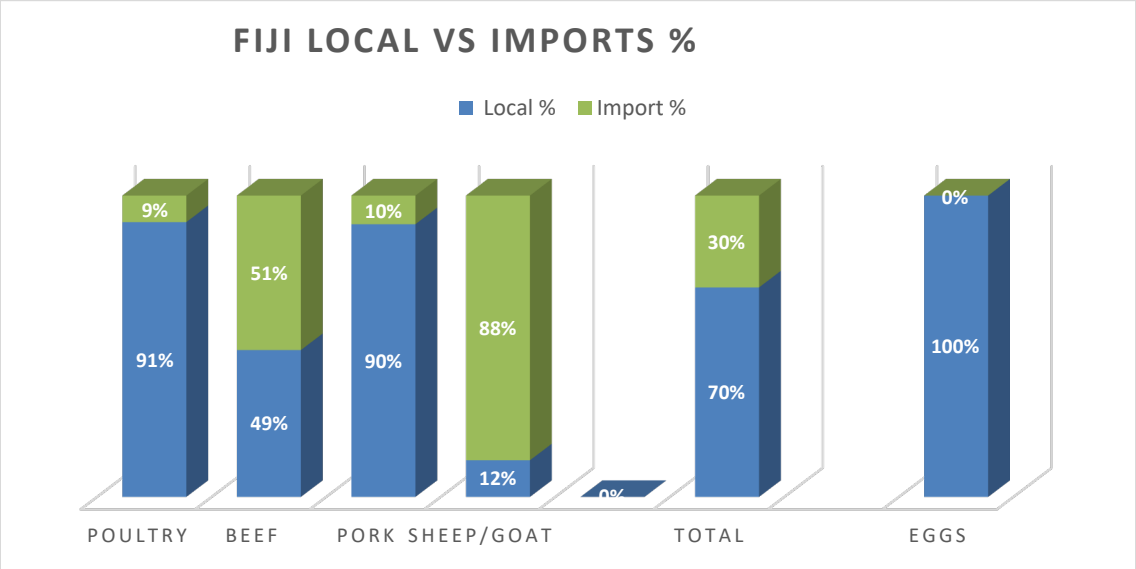

Figure 11: Self-sufficiency in all meats

Source: Cole, S 2016 Presentation to Livestock Strategy Validation Workshop[5]

The trends in Volumes Values and price of all meat imports is represented in Tables 8, 9 and 10.

Table 8: Trends in Meat Imports Volumes

Product label	All neat volumes (tonnes)				
	2013	2014	2015	2016	2017
Fresh beef	123	55	140	42	18
Frozen beef	1,162	1,332	788	1,288	941
Pork meat	187	198	101	208	298
Sheep meat	4,668	5,154	5,037	4,383	5,957
All offal	1,208	1,633	876	1,442	1,215
Poultry	986	1,158	1,136	2,157	3,072
Brined meats	19	13	78	89	90

Source: World Trade Map 2013 to 2017

[5] Note, this data is based on lower volume commercial production figures and does not include subsistence production and consumption.

Table 9: Trends in meat imports value

Product label	All meat value AU$ (000)				
	2013	2014	2015	2016	2017
Fresh beef	1,040	554	1,156	454	270
Frozen beef	4,748	5,574	4,427	5,743	5,205
Pork meat	966	1,354	847	1,672	2,062
Sheep meat	16,108	21,413	20,234	27,300	29,753
All offal	2,218	2,851	1,564	2,755	2,322
Poultry	1,896	1,917	2,005	6,616	6,883
Brined meats	202	153	706	774	643

Source: World Trade Map 2013 to 2017

Table 10: Trends in meat imports price (AU$/kg)

Product label	All meat price AU$/kg				
	2013	2014	2015	2016	2017
Fresh beef	8.46	10.07	8.26	10.81	15.00
Frozen beef	4.09	4.18	5.62	4.46	5.53
Pork meat	5.17	6.84	8.39	8.04	6.92
Sheep meat	3.45	4.15	4.02	6.23	4.99
All offal	1.84	1.75	1.79	1.91	1.91
Poultry	1.92	1.66	1.76	3.07	2.24
Brined meats	10.63	11.77	9.05	8.70	7.14

Source: World Trade Map 2013 to 2017

The vast majority of meat imports to Fiji come from Australia and New Zealand (Figure 12)

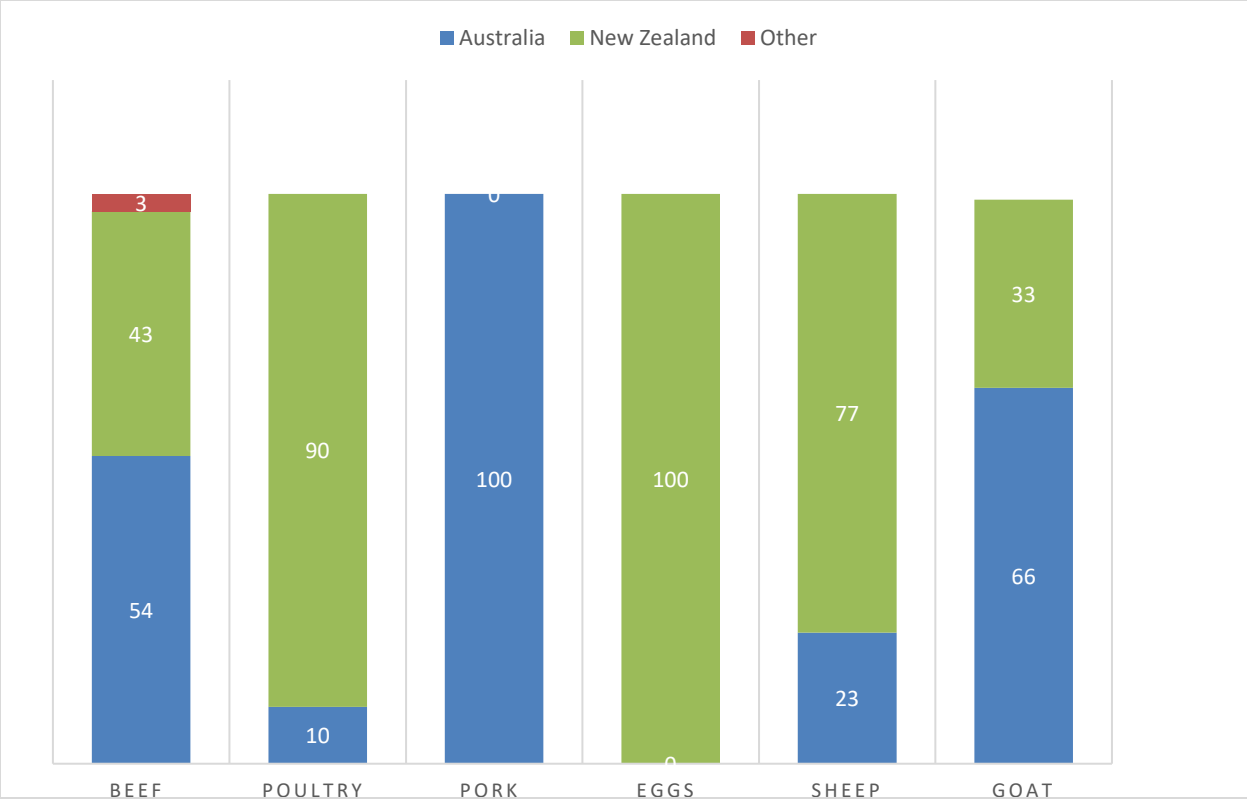

Figure 12: Country source of Fiji meat imports

Source: Cole (2016)

8.2 Fiji beef re-exports

The only livestock product that is exported from Fiji is canned corned beef. FAOStat reported that around 1,100 tonnes of meat preparations were exported. The World Trade Map records 820 tonnes of exported preserved beef products (corned beef cans). It also records 290 tonnes of sausage but does not differentiate this between animal source products.

All the meat and offal raw material for canning is imported. A standard corned meat formulation includes approximately 30% meat and 50% offal in the canned product. This represents a re-export of around 330 tonnes of beef and 550 tonnes of offal. This successful processing (Foods Pacific)[6] and re-export represents 32% of the beef and 46% of the imported offal imported.

A cheap supply of manufacturing meat and low-cost offal is essential to the manufacture of a competitive canned corned meat and importing raw materials for value adding prior to re-export is encouraged in many developing economies and should not in any way be discouraged in Fiji. This fact is recognized and the canning company (Food Pacific) can obtain meat and offal products for canning and re-export free of duty and excise charges.

Only very low volumes of fresh or frozen beef is re-exported.

[6] www.foodspacific.com

Table 11: Beef exports from Fiji

Product label	Export meat preps (tonnes)				
	2013	2014	2015	2016	2017
Meat sausage	218	95	52	97	290
Preserved meat	821	1,178	636	603	834
Prepared meat bovine	775	1,084	610	557	820

Source: World Trade Map (2013 to 2017)

Table 12: Meat exports from Fiji

Product label	Export meat volumes (tonnes)				
	2013	2014	2015	2016	2017
Beef	156	74	10	16	18
Pork	6	9	55	10	6
Sheep	101	120	22	26	28
Poultry	98	144	240	307	293

Source: World Trade Map (2013 to 2017)

8.3 Breakdown of beef imports

Most of the beef imported into Fiji by volume is low value frozen beef, beef preps, or beef offal. This is used in the production of canned corned beef (Figure 13). Imports have remained relatively stable in recent years.

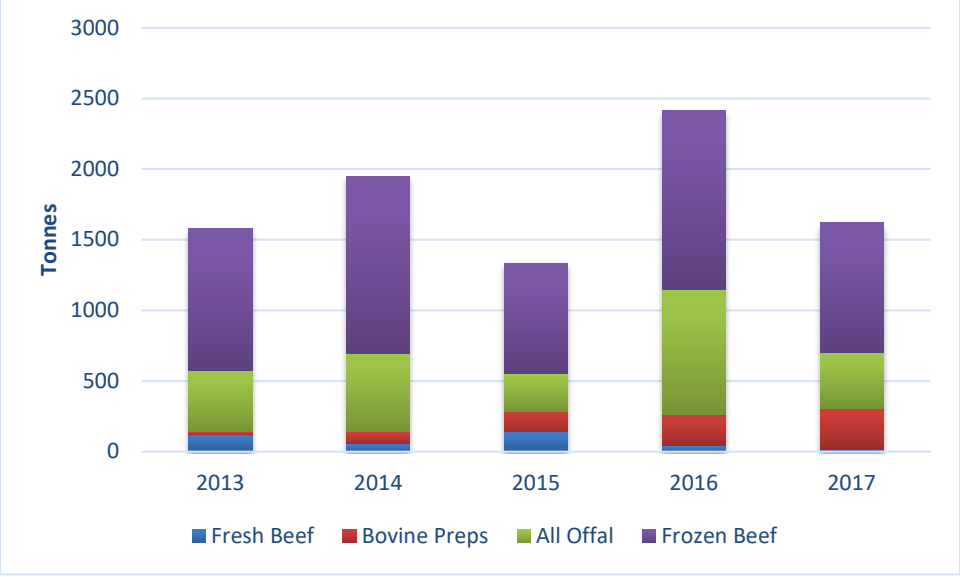

Figure 13: Trends in beef imports by product (adjusted for re-exports)

Source: World Trade Map (2013 to 2017)

8.4 Frozen beef imports

The largest component of meat import volumes is frozen beef**,** of which, boneless beef is the largest single product (Table 13). This relatively low value product is used in the manufacture of corned beef.

Table 13: Frozen beef meat imports trends in volume, value, and price

Product label	**Frozen beef volumes (tonnes)**				
	2013	2014	2015	2016	2017
Frozen carcass beef	96	25	56	44	41
Frozen boneless beef	1,066	1,306	732	1,244	900
Product label	**Frozen beef value AUD (000)**				
Frozen carcass beef	285	173	290	444	314
Frozen boneless beef	4,461	5,400	4,136	5,301	4,885
Product label	**Frozen beef price AUD/Kg**				
Frozen carcass beef	2.97	6.92	5.18	10.09	7.66
Frozen boneless beef	4.18	4.13	5.65	4.26	5.43

Source: World Trade Map (2013 to 2017)

8.5 Fresh beef imports

Fresh beef imports are low volume, but high value quality cuts of beef used in the food service sector such as hotels, resorts, and restaurants (Table 14).

Table 14: Fresh Beef meat imports trends in volume, value, and price

	Fresh beef import (tonnes)				
Product label	**2013**	**2014**	**2015**	**2016**	**2017**
Fresh carcass beef	5	3	0		
Fresh bone in cuts	6	10	45	6	11
Fresh boneless cuts	113	42	94	36	7
Product label	**Fresh beef value AUD (000)**				
Fresh carcass beef	59	51	7	0	0
Fresh none in cuts	920	369	930	403	150
Fresh boneless cuts	62	133	219	51	120
Product label	**Fresh beef price AUD/Kg**				
Fresh carcass beef	11.80	17.00			
Fresh bone in cuts	153.33	36.90	20.67	67.17	13.64
Fresh boneless cuts	0.55	3.17	2.33	1.42	17.14

Source: World Trade Map (2013 to 2017)

8.6 Quality cuts in fresh meat imports

Fresh beef imports are exclusively quality cuts for the hotel trade (Figure 14).

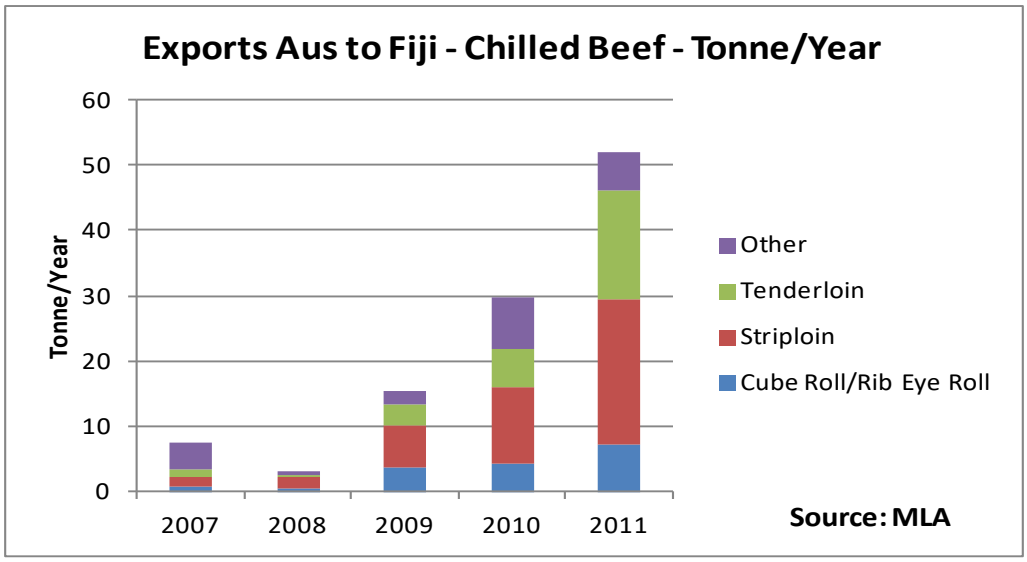

Figure 14: Quality meat imports by cut

Source: Cole and Marlow (2012)

8.7 Meat offal and preps

Bovine offal is used in the manufacturing of corned beef and are low value but achieve the chemical lean standards required by the meat processing industries (

Table 15).

Table 15: Offal meat imports trends in volume, value, and price

Offal volume (tonnes)					
Product label	**2013**	**2014**	**2015**	**2016**	**2017**
Bovine Tongue	303	447	161	195	337
Bovine liver	2				25
Other bovine offal	899	1,150	713	1,246	817
Porcine offal	3	16			
Ovine offal		19	1		36
Offal value AU$ (000)					
Bovine Tongue	477	691	262	304	561
Bovine liver	2				25
Other bovine offal	1,732	2,092	1,301	2,453	1,708
Porcine offal	4	24			
Ovine offal	1	43	1		29
Offal price AU$/kg					
Bovine Tongue	1.57	1.55	1.63	1.56	1.66
Bovine liver	1.00				1.00
Other bovine offal	1.93	1.82	1.82	1.97	2.09
Porcine offal	1.33	1.50			
Ovine offal		2.26	1.00		0.81

Source: World Trade Map 2013 to 2017

The importation of beef preps has risen significantly in recent years. It is more expensive than beef offal and is unclear where this product is being used (

Table 16).

Table 16: Meat prep imports trends in volume, value, and price

Product label	Meat prep volumes (tonnes)				
	2013	2014	2015	2016	2017
Poultry preps	52	18	5	51	55
Pork preps		45	2	4	2
Bovine preps	16	89	147	219	287
Other preps	135	221	133	137	49
Product label	Meat prep value AU$ (000)				
Poultry preps	352	147	37	355	390
Pork preps	0	290	24	35	29
Bovine preps	121	702	1156	1333	1516
Other preps	263	370	249	198	80
Product label	Meat prep price AU$/kg				
Poultry preps	6.77	8.17	7.40	6.96	7.09
Pork preps		6.44	12.00	8.75	14.50
Bovine preps	7.56	7.89	7.86	6.09	5.28
Other preps	1.95	1.67	1.87	1.45	1.63

Source: World Trade Map (2013 to 2017)

The trend in imports is relatively stable considering total and meats imported just for local consumption (Figure 15).

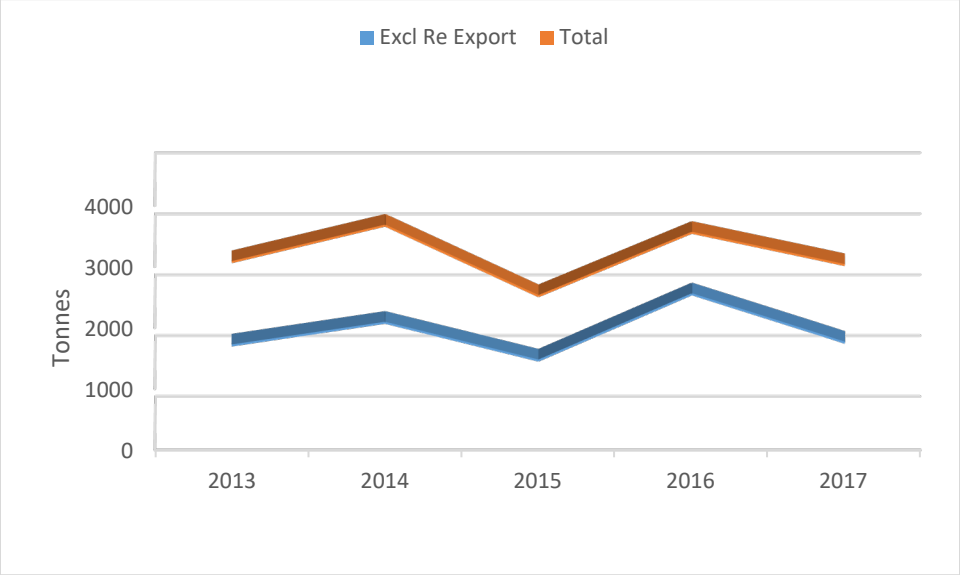

Figure 15: Trend in import volumes

Source: World Trade Map (2013 to 2017)

9 Fiji Meat Industry Board abattoirs

9.1 Background

Meat is processed through the two FMIB abattoirs, which represent all commercial beef on Viti Levu and meat that enters formal market value chains.

The FMIB was established under the *Fiji Meat Industry Act* 237 (1970). The vision of FMIB is:

> *"To be a leading provider of hygienic and safe meat products and to be an internationally recognized manufacturer of leather products".*

It operates two main abattoirs:

- The Nasinu, Nine Miles, near Suva, established in 1976. The Suva property sits on 35.4 Ha of state land. The land has a 75 year Crown lease granted on 01/07/1976. The Suva abattoirs was constructed and commissioned in 1976 with NZAID funding, and;
- The Vuda Abattoir was established at Vuda Point near Nadi in 1983. The Vuda property sits on 6.35 hectares of Native land. The land tenure is a 75-year Native lease granted in 01/01/1982

Both abattoirs have rendering plants attached to them. The FMIB previously ran a tannery that was closed in 2005/06 due to a lack of markets and ongoing losses. The board operates under the line of the Ministry of Agriculture with regular oversight from the Ministry of Public Enterprise as from January 2006. Meat Inspection services at FMIB abattoirs are provided and supervised by the MoA. The FMIB generates its own funds to finance its daily operations.

The FMIB, under the Act, centralised slaughtering to their two abattoirs at Suva and Vuda. This forced many local or rural slaughter facilities to close. However, it seems likely that local or bush slaughter is widespread and provides meat to commercial butchers in each of the major towns in the West. The government has recently cracked down on illegal slaughtering and has resulted in more goats passing through the FMIB abattoirs.

9.2 Financial position

Historically, the FMIB provided a service function and simply charged a slaughter fee to butchers (for non-magiti trade) who buy animals from middlemen or farmers. Losses caused by an unsuccessful investment in a tannery, swallowed all capital reserves and threatened the operations of the FMIB. As a result, the FMIB lacks funds for further capital investment. Recently it has sold some of its prime land to raise capital.

Eight years ago, new management set about restoring the viability of the FMIB and this has largely been achieved. The recovery package included the FMIB buying cattle (and pigs) and selling directly into the market for magiti sales. The board has recently introduced additional higher margin enterprises such as deboning and further developing the magiti trade into a full butchery service. The former takes away a farmer's margin as it offers a wholesale price not the higher magiti retail price (although it occasionally acts as a market of last resort for small farmers with low quality stock). The latter impinges on the role of butchers. It is difficult for the industry's regulatory body to operate in direct competition with the industry which it is expected to serve. The current board of the FMIB does not include a farmer or a butcher and is seen to operate in isolation. It has been suggested as part of the review of The Meat Industry Act Cap 137 1985 that this situation must be reviewed.

9.3 Service provider or cattle buyer

FMIB operates as a service provider and traditionally did not own the carcass. In other countries the abattoir becomes the owner the product and sells boxed meats. This would remove competition in the Fiji meat market. Details of their present operation and trends are presented below (Table 19).

9.4 Current condition

Both FMIB's abattoirs are coming to the end of their life (established in 1976 and 1983) and are likely to be encroached by urban (Suva) or tourism development (Vuda). There has been much talk of a new single larger replacement abattoir built to export standards as well as the introduction of a similar facility in the North. Some stakeholders in the meat sector feel that the meat industry would be better served if FMIB was dissolved, the private sector allowed to operate abattoirs, and a newly formed beef/sheep council given the task of representing the industry.

9.5 Export standards

The FMIB abattoirs do not meet Australian export standards but were never intended for export trade. They are considered adequate in Fiji and have achieved a HACCP standard. The government is currently preparing a plan for a coordinated approach to ensure food safety, especially to protect the tourist trade. An EU mission did not consider this aspect to be a major constraint to development of the livestock sector, particularly as cattle numbers continue to fall well below the capacity of the existing infrastructure.

9.6 New facilities

The introduction of new facilities both on the mainland and on the outer islands has been discussed on a regular basis. It was touted that Fiji needed to build an export-quality abattoir. However, with declining throughput and the beef industry based largely on culled dairy cows and culled working bullocks, there is limited opportunity to export meat from Fiji. The by-product required by the substantial corned meat processing facilities in Fiji is of much lower quality than any offcuts of the small-scale processing plants in Fiji.

Recently, the government put out to tender the opportunity to construct and operate abattoirs in Fiji as a Public Private Partnership. Government had about four applicants to provide this service but at this point has not progressed with the privatisation of their slaughter facilities. The FMIB's plant at Nasinu, Nine Miles is now surrounded by suburbia. This land could be used for much higher value purposes than an abattoir. The board was asked in 2017 to locate to new premises. A suitable piece of land was located at Saweni, outside Nausori. It is not clear at this point if the government intends to pursue this option.

The abattoir in the West is now located in the middle of a residential and tourist development. It is also likely to close as the lease is about to expire. Board reports suggest that there is only about 10 years left on the lease.

Both abattoirs are combined pig and beef facilities and cater for sheep and goats. This causes issues with the Muslim community and the FMIB must apply for and follow strict guidelines for the slaughter of animals.

Any plans for further abattoir development should be market-conforming, especially if private sector investment and management is incorporated. While it might be technically feasible to build a large modern export standard abattoir, it is unlikely to be viable if operating under-capacity and may also price

local meat out of the market. Great care needs to be taken in rightsizing any new facilities to the volumes of expected cattle.

9.7 Meat inspection

The government undertakes regular and effective meat inspection at their two abattoirs, as well as the informal slaughtering in registered slaughterhouses in the Northern Division. Government officers do not attend bush slaughtering.

9.8 Slaughter in the north

There has been considerable discussion of building a new abattoir in the Northern division cane area, which would boost meat production. However, much of the beef in the division is produced in the south of the island and on Taveuni Island, where cattle farmers already have their own slaughter facilities, and there are also several under-utilised slaughter facilities around Labasa, including a new privately-operated rural slaughterhouse in Tabia. A new abattoir would also reduce the present intake at the other FMIB abattoirs in Suva and Vuda. It is more expedient to upgrade existing FMIB abattoirs in Vuda and Suva, especially through improved hygiene and cooling facilities or support the construction of small private abattoirs suited to the scale of production, monitored by the Government but operated by private interests.

9.9 FMIB volumes

The volume and number of head processed at FMIB are regularly reported (FMIB, various years). These values are the basis of commercial invoicing and are therefore a very accurate reflection of the commercial meat trade (Table 17).

Table 17: Head and tonnage processed at FMIB

	Beef		Pigs		Goats		Calves		Sheep	
	No.	Tonne	No.	Tonne	No.	Tonne	No.	Tonne	No.	Tonne
2011	7,121	1,942	15,599	899	1,129	12.3	387	7.5	177	2.8
2012	7,174	1,833	16,655	980	294	3.3	358	6.7	27	0.4
2013	7,160	1,849	16,109	967	169	1.9	203	3.8	60	0.6
2014	7,589	1,895	15,208	887	558	6.6	100	1.8	64	0.9
2015	8,471	2,042	16,181	978	603	7.5	55	0.9	33	0.4
2016	8,327	2,032	14,473	864	486	6.4	10	0.2	47	0.9
2017	8,381	2,068	14,083	917	812	8.7	69	0.9	84	1.2

Source: FMIB (various years)

Beef cattle can be further broken down by class (

Table 18).

Table 18: Trend in beef cattle by class, number and Tonnage

	Steers		W/Blk		Bulls		Cows		Heifers		All beef	
	No.	Tonne	No.	Tonne	No.	Tonne	No.	Tonne	No.	Tonne	No.	Tonne
2011	2,291	571	2,085	719	1,771	454	871	152	202	47	7,121	1,942
2012	2,231	569	1,603	536	2,064	511	1,171	200	105	17	7,174	1,833
2013	2,131	572	1,227	409	2,512	637	1,183	212	107	19	7,160	1,849
2014	2,271	592	1,137	389	2,700	655	1,197	211	284	48	7,589	1,895
2015	1,846	424	1,704	582	2,878	691	1,671	290	372	57	8,471	2,042
2016	1,935	435	1,536	523	3,118	761	1,266	231	472	81	8,327	2,032
2017	2,133	507	1,284	444	3,471	854	1,052	185	440	79	8,381	2,068
%	25%	25%	15%	21%	41%	41%	13%	9%	5%	4%	100%	100%

Source: FMIB (various years)

9.10 Killing fees and an increase in fees

The FMIB as a service provider charges a fee based on hot carcass weight. Whilst kidneys remain with the carcass at weighing, all other offal is removed. The heart and liver (unweighed) are then added back to the carcass and delivered to the butcher at no cost.

The responsibility of the FMIB is to slaughter the animal and eviscerate it. Meat inspection is conducted by MoA meat inspectors who also weigh carcasses. The FMIB is then responsible for chilling the carcass to 4°C in the shortest possible time and for delivering the carcass to the end user.

For this service, the current charge to slaughter beef animals is $0.37/kg hot carcass weight (head off, hooves off, liver, head, heart, and lungs out, kidneys in). An increase in this fee structure was proposed over four years ago. The entire industry was consulted and agreed to the increase. To date, the government bureaucracy responsible for the control of the FMIB has failed to implement the new charges. As a result, the FMIB remains under financial pressure and unable to replace capital equipment.

9.11 Northern division slaughter facilities

In addition to the two main FMIB abattoirs above, there are now five small (one or two cattle per day) slaughterhouses in the Northern division, four on Vanua Levu and one on Taveuni. Two of these were constructed by the government, the other three are owned by the private sector. The formal difference between a slaughterhouse and an abattoir, which defines where meat can be sold, is that the slaughterhouses do not contain chiller facilities thus breaking in the cold chain. Meat from slaughter houses is transported as hot carcasses to privately owned chilling and processing facilities.

Because of this, under The Meat Industry Act Cap 137 1985, meat slaughtered in the North was previously not allowed to be sent for sale on the mainland. It is however suitable for sale in the North through several outlets including some five-star hotels. As a result, live cattle were previously shipped from the North to the mainland for slaughter to enter the formal markets. With a strong demand for quality beef in the North, it was largely culling cattle that were transported to the mainland as the best beef cattle, grown on coconut plantations, remained in the North.

An amendment to The Meat Industry Act Cap 137 1985 in 2016[7] now allows the transport of meat, as opposed to cattle, from the North to the mainland. The government is now officially encouraging this trade, but it will take time to increase supply.

Government meat inspectors attend all slaughtering at these facilities. The author visited most of the slaughter facilities in 2012. They are well maintained and spotlessly clean and all are used on an irregular basis.

9.12 Traditional slaughter

Beef is used in traditional functions or consumed for household purposes in both the Fijian and Muslim communities of Fiji. Qurbani is one of the largest meat-eating periods in Fiji where the needs to slaughter an animal in line with the traditional Halal methods is essential. One beef animal represents the contribution from seven families in the Qurbani offerings. Government meat inspectors try to monitor the Qurbani slaughter.

There is less of a tradition for beef consumption in the Fijian community where pork and fish are predominant. However, most Fijian families in the rural areas have grazing lands and maintain a small number of cattle which are often used to provide foods at large family gatherings. Slaughter methods in these traditions are often basic.

In the dairy sector, male bobby calves are often sold in return for pasture or fencing and are slaughtered as vealers for consumption.

There is no formal meat inspection of these animals at slaughter. Slaughter takes place in the bush typically away from even the most basic of facilities.

10 Market standards and pricing

The beef industry is differentiated by the concept of quality, namely, premium, culled, and canned. Premium beef is derived from animals specifically grown to produce beef. At slaughter, in the abattoirs, these will be classed as prime steers. Culled cows are old cattle from the dairy industry, together with culled working bullocks from the cane sector. Canned beef is predominantly derived from beef offal collected from large abattoirs (overseas) and exported in bulk to Fiji for processing.

10.1 Costs and competition

To provide protection against the economies of scale and comparative advantages of Australian and New Zealand beef, Fiji applies a 15% tariff on imported beef. It is quite an achievement of Fiji to be competitive much larger overseas industries in agglomerated exports, of virtual waste products of mechanically deboned meat and offal used in the canning sector.

10.2 Grading

Grading at the FMIB abattoirs is very basic, where cattle are sorted into class for example, prime steer or cull cow. These definitions are sometimes arbitrary with working bullocks often being classed as prime

[7] www.paclii.org/fj/legis/consol_act/mia178.pdf

steer. No attempt is made to introduce even the most basic quality standards, such as counting teeth or specifying a weight range.

This makes little difference for the FMIB abattoirs because they don't take ownership of the animal but provide slaughter services. The financial deal is between the supplier (middleman) and the butcher. There is a price differential identified between prime steer and cull cow.

At the butchers, the supply of premium quality cattle is less than 20% (excluding South Pacific Butchery) which is said to be too small to warrant differentiation. Certainly, in visiting meat outlets, there is no price differential for a prime steer. It must be remembered of course that quality in the local market is not the same as quality in the typical Western market. There is no tradition of eating steaks in Fiji. Most meat is slow wet cooked as curry or stews, and cooking methods that are designed to make meat tender. In fact, there is a preference for tougher meat, considered more flavoursome meat, and meat containing large quantities of fat.

Consumers in the Northern division looking for prime steers buy directly from farmers or butchers, while consumers in the Western division can regularly find prime steer beef at the South Pacific Butchery, which also delivers weekly to Suva. Most consumers are driven by price and do not seek out the higher value (quality) cuts of meat.

10.3 Quality import cuts

While overall demand for imported beef appears to be falling this is not the case for quality beef cuts where demand and supply of high-end, high-priced, quality cuts of beef has been increasing.

10.4 Canning

The quality of beef used for canning is much lower than any beef derived from local cattle. The demand for local fresh beef utilises all of the available products in higher value markets. Products used in the canning industries in Fiji are derived from imported by-products.

10.5 Price comparisons

An indication of price differentials in imported and domestic beef is shown in Table 19.

Table 19: Indicative prices of various beef product

Type	Bone out	F$ Per Kg	Notes
Imported primal cuts	Bone out	$25.00 / kg	(Filet, sirloin, and rib eye about 16% of total)
Local premium beef	Bone out	$ 10.00 / kg	($7.00 carcass weight at 70% bone out)
Local cull beef	Bone out	$ 8.60 / kg	($6.00 carcass weight at 70% bone out)
Canned Imports	Bone out	$ 3.00 / kg	(Tongue root, and gristle)

Source: Butcher survey for this study by Simon Cole (2018)

10.6 Retail prices

All retail prices above are for local beef. They reflect the selection of carcasses with South Pacific Butchery selecting only prime steer beef and Tembara selecting lower quality carcasses (

Table 20).

Table 20: Retail meat prices (F$)

	Fiji Meats	South Pacific	Tembara
Rump	18.95	29.90	12.99
Gravy	15.50	15.90	11.99
Round	15.50	18.90	12.49
Sirloin	27.00	39.90	14.99

Source: Butcher survey for this study by Simon Cole (2018)

10.7 Utilisation of by-products

Both FMIB facilities include rendering plants. All by-products from the slaughter of cattle and pigs is rendered into meat meal. The quality of this meat meal is slightly lower in protein than international products but higher in energy because of the inability of the plants to remove all the tallow from the final product. Demand for this product is high and is sold to the pig industry who also support the FMIB through the slaughter of pigs. Other demand for meat meals must be met from offshore.

The FMIB was unsuccessful in the operation of its tannery factory and lost significant amounts of cash in this venture. Hides are now sorted and stored for export.

In addition to selling meat from cattle purchased by the FMIB, FMIB also sells tripe and other offal, typically to the Chinese community.

11 End user markets

11.1 Commercial beef outlets and product offerings

Fiji is predominantly a price driven market. Low quality products predominate the commercial sector including tinned beef, mutton, and fish which represent the lowest value protein sources available to the population. These meat sources are by-products of large meat industries in Australia and New Zealand.
Beef is available as:

- Processed meat, predominantly canned meat, in most supermarkets and retail stores in the formal retail market sector;
- Fresh or frozen meat cuts only in the higher end supermarket chains; and
- Fresh product is available at a relatively small number of independent processors and retail butcher outlets. A high proportion of the independent butcher outlets are operated by members of the Muslim community.

An example of a butchery in Lautoka is Fiji Meat Ltd. It slaughters about 15-20 head or 4-5 tonnes per week in the busy tourist season. It buys mainly working cattle, which can be hard to buy in cane harvest season. It also occasionally gets consignments from outer islands. The butchers buy from traders on an over-the-hook basis, and service kills at the abattoir (Nadi) ($0.37/kg carcass weight fee and a small inspection fee, the abattoir keeps offal). There is no grading except to differentiate (with small price differences) between cattle over or under 400 kg carcass weight.

11.2 The magiti market

The ceremonial or magiti market provides a good return for farmers as the cattle are essentially sold and consumed at the source. This reduces costs involved with transport to and from abattoir and slaughter and refrigeration costs, and the buyer can utilize all the parts of the animal.

The magiti cattle market demand of around 2,000 tonnes per annum (8,000 cattle) and is supplied from small-holder farmers who supply directly for consumption at either the household or, more often, at festive occasions. These small-holders include all ethnic groups in Fiji and are widely dispersed across all agricultural regions. A significant proportion of small-holder cattle production also enters the formal market (See Figure 8).

While the magiti market commands a higher price than other market sectors, this is due to reduced costs in the value chain rather than demand exceeding supply. If the magiti market was in short supply, it would be expected that middlemen would have more difficulty sourcing cattle for the formal market.

Some animals sold into the magiti markets are possibly quality animals but there is little expectation or differentiation of quality in the slaughtering process of these animals. Cattle sold into the magiti market fetch between F$800 to F$1,000 on the hoof, which is a similar price to the local wholesale market.

11.3 Premium quality local beef

The supply of premium beef is dominated by output from the Yaqara Pastoral Company, a government owned and run enterprise in the north-west of Viti Levu. There are a number of other smaller commercial producers, mainly in the North on Vanua Levu and Taveuni. Some prime steers are also collected in small numbers from the cane and dairy belt areas. Many Fijian communities maintain their own beef herds for village consumption. The exact volume of this sector is difficult to quantify because they do not enter the formal sector. The balance of the national requirement for premium quality beef, mainly from the tourist industry, is imported as high quality boned out primal cuts.

Local quality beef is sold through the local butchers to the top end retail market. South Pacific Butchery is conspicuously located on the road to Denerau near Nadi, a major hotel area and the largest concentration of wealth in the country. Retail prices for locally produced premium beef is close to the imported prices.

Other retail butchers, who possibly have access to prime steers in their regular purchases (Fiji Meats estimates about 20% is prime steer), do not have the volume of product or the market location to differentiate this product at their outlets. For this reason, it is possible to get an excellent portion of local beef, at a local retail butcher, and at a local price, but supply may be inconsistent.

11.4 Culled beef

Culled cows predominate in the dairy sector in the Central division in the East of Viti Levu. The balance of the cull cows are collected by a network of middle men, who pay cash for animals collected from their travels throughout the cane areas, particularly in the West of Viti Levu. These animals make up the bulk of the local beef consumed.

The bulk of local cull beef is sold through the retail butchers at local prices. Expectations of quality in the local market are much lower than in the hotels. It is possible to hang beef in different orientations, and a number of retail butchers also bone out and age beef in special chillers for a period of up to thirty days.

Unfortunately, a specially hung and aged cull cow is still cull cow and although possibly improved, but can never be classed as prime steer.

11.5 FMIB distribution of beef to butchers

The beef meat sector is relatively competitive with many players in the market. The distribution does not differentiate between cattle type (Table 21)

Table 21: Distribution of FMIB cattle to butchers

Outlet	Central	Outlet	Western
Tebara Suva	15%	South Pacific	8%
Tebara Nausori	8%	Fiji Meats	6%
Nausori Meats	6%	West Butcher	8%
Ali's Halal	10%	Fresher	1%
Whaleys	8%	Rashid's Halal	4%
Leylands	4%	Ray's Reds	1%
Others (6)	13%	Others (14)	7%
Total	64%		36%

The beef required for the canning is almost totally imported as boned out offal. It is not possible for locally grown whole animals to compete with the cost of this waste product.

11.6 Hotel trade and food service

Significant quantities of beef are consumed in the food service sector in a variety of forms.

- In high end restaurants quality grilling cuts sourced both locally (for example South Pacific Butchery from Yaqara cattle) and from imports;
- In mid-range restaurants a range of products including product used in grilling cuts, curries and wet dishes, hamburgers, and sausages; and
- In fast food restaurants for hamburgers and items such as steak sandwiches.

It is estimated that 1,500 tonnes of beef is consumed in the food service sector per year and almost half of this is estimated to be tourism consumption (750 tonnes/annum). Only 10% of this are likely to be prime cuts. A profile of cattle classes slaughtered at FMIB is provided (Figure 5). Just over 2,000 of the 7,000 cattle slaughtered were steers and these produced 570 tonnes of reasonable quality beef. This would provide about 10 tonnes each of tenderloin and ribeye and 25 tonnes of striploin.

The tourist industry has highly specific demands for quality and only imports the best quality cuts from prime steers to achieve this. Much of this product is imported directly by the hotels as it is not available from the local butchers. The balance of the carcass, over 80%, is consumed in the lower value local market. It is calculated that the tourist industry would require quality cuts from an unlikely 20,000 prime head to meet this demand.

11.7 The sale of weaner cattle and bobby calves

Male calves in the dairy sector are expensive to rear on calf milk replacer. Also, the management of the system is very poor with a high mortality even amongst female calves. As a result, young calves are almost

a liability to a dairy farm. These animals are therefore sold in return for pasture or fencing work done on the dairy farm. Very few of these young animals enter the formal meat market.

There is only a minimal trade in weaner stock.

11.8 The role of middle men

The local beef industry is served by a network of Muslim intermediaries. These dealers go out into the farm areas and buy cattle for cash on the hoof. Middle men sell the animals to the butchers and are paid on a per kg basis of hot carcass weight as recorded on the official killing sheet. Working together as a group, they, dominate the market. They are often accused of profiting at the expense of the farmer. However, they provide a service and resolve a logistical nightmare of collecting individual animals from many locations and play an important part in the industry.

11.9 Export markets

A significant amount of beef (approximately 1,000 tonnes/annum) is exported as canned corned product. Standard canned corned meat formulations comprise almost twice as much offal as meat. The export volume indicates that as in the region of 625 tonnes of imported offal and 375 tonnes of beef are exported in canned form. This is equivalent to almost 40% of the volume of beef imports.

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