Final report

FutureBeef Website Content Review

Project code: L.GFB.2101

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Abstract

The aim of this project was to improve the FutureBeef website which is the main online source of information on cattle production across northern Australia.

The two key tasks of this project were to:
- critically review the technical content of the FutureBeef webpages to identify information that is misleading, out-of-date or in some other way requiring amendment
- to propose an improved system of navigating the website and searching for information.

The project was carried out by Mr Neil MacDonald and Emeritus Professor Dennis Poppi between March 2021 and March 2022.

The reviewers found that the quality of information on the website was overall high. There was little considered misleading, though there were minor issues to correct in one third of the pages.

A new structure was proposed which included describing the category or type of each webpage, the topic and subtopic that it fitted under and keywords that could be used to search for the subject.

The reviewers concluded that FutureBeef was a valuable source of extension information for producers, extension officers, advisors and researchers, and they made recommendations for further improvement.

Executive summary

Background

As of 2021 the FutureBeef website had over 700 webpages linked to multiple documents and other websites. Industry feedback indicated that some of the pages may have become out-of-date and some of the information misleading. There was also feedback from users that information was not easy to find on the website.

The project team, of Neil MacDonald and Emeritus Professor Dennis Poppi, was contracted in March 2021 to review the content of website and propose a new structure to make it easier to find information.

Objectives

The aims of the project were:

1. To review the technical content of most of the pages in the FutureBeef website, to identify content that was misleading, out-of-date, hard to understand, or in any other way needing amendment.
2. To devise a new structure to make searching for information easier.

Methodology and results

The project team reviewed 763 webpages and documents. In general, it was concluded that the standard of the information was very good. Very little information was misleading, most was up-to-date, and almost all of it was well presented and used suitable language. Minor changes were recommended to 198 pages, most of which were broken links caused by changes in external websites. A further 41 pages were considered outdated but not misleading and revision/updates to these pages were recommended. A total of 32 pages were recommended for removal, being considered redundant because they were focused on events that had passed or added little to a topic that was presented in a better form elsewhere.

A new structure was proposed. All webpages were allocated to topic/subtopic and the number of categories or types of webpages was enlarged. This enabled use of filters to allow users to identify categories of information on their chosen topic or interest.

A list of keywords was also developed for ease of use, integrated in the back-end of the website as well as presented as a search function.

Benefits to industry

The FutureBeef website is the main source of online information for producers, extension officers and advisors across the north Australian beef industry. Setting up and maintaining this service has been a major achievement. This project will help to update the website, guarantee the reliability of the information and make searching easier.

Future research and recommendations

The main recommendation was that the scope of extension material and research reports be enlarged, with an effort to source more pages from the Northern Territory, Western Australia, CSIRO, the university sector, landcare groups and producer organisations, all of which are under-represented compared to the Queensland Department of Agriculture and Fisheries. It is proposed that FutureBeef be proactive in

requesting material to fill knowledge gaps and be prepared to regularly cull less important pages so the size of the website does not grow beyond manageable levels.

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1. Background

1.1 The FutureBeef partnership

FutureBeef was established in 2012 as a partnership between the Department of Agriculture and Fisheries Queensland (QDAF), the Department of Industry Trade and Tourism Northern Territory (NT DITT), the Department of Primary Industries and Regional Development Western Australia (WA DPIRD), and Meat & Livestock Australia (MLA). By combining and coordinating resources, the objective of FutureBeef was to improve the delivery of online information and extension products across the north Australian beef industry. The main mechanisms to achieve this have been webinars, best practice videos, social media and the maintenance of a comprehensive reference library on the FutureBeef website. The success of the FutureBeef initiative, with high levels of activity and industry engagement, and high approval ratings from participants, was comprehensively analysed in the final report of MLA project E.INV.1412 (James & McIntosh 2017).

FutureBeef is funded by MLA, and managed by a project officer from QDAF, guided by a steering committee comprising senior representatives of all the partners. Each of the jurisdictions also has an extension officer responsible for contributing items to the website and social media activities.

1.2 The FutureBeef website

As of 2021, the information on the FutureBeef website included over 700 webpages, which in turn linked to multiple documents and other websites. Industry feedback was that some of the pages may have become out-of-date and may include misleading information. There was also feedback from users that information was not easy to find on the website.

The project team of Neil MacDonald and Emeritus Professor Dennis Poppi was contracted in March 2021 to review the content of website and propose a new structure to make it easier to search for information.

2. Objectives

The goal and deliverables from the Schedule of Work, and the project's achievements in addressing these, are described in Table 1.

Table 1: Achievement of goals and deliverables

	Goal and deliverables	Achievement
Goal	To have approximately 500 pages of technical content on the FutureBeef website reviewed by subject matter experts and to allocate the reviewed pages to newly drafted topic and sub-topic heading to improve the user website experience.	Achieved. A total of 731 pages were reviewed. A new structure was proposed with pages allocated to topic and subtopic, category (type), and keywords added.
1	Scan all priority pages to identify the subject matter	Achieved. All pages were scanned.
2	Engage and sub-contract subject matter experts to review priority pages ensuring;	Achieved. It did not prove practical to separate priority pages as all had to be read to be allocated to the new structure, and to identify those recommended for removal, for changes or for later updating. Specialist experts, and in particular the original authors, were consulted for some pages, but as this was extension material Professor Poppi and Mr MacDonald had enough knowledge to assess most pages.
	Producer friendly language	All pages were checked for suitable language. Only two were recorded as being non-producer friendly.
	Any new/updated information is added from other reliable and credible sources	Notes were written for all pages that were recommended for changes, removal or later updating (approximately 30% of all pages)
	Links on the page are working and if not, an alternative source identified, if possible	All links were checked. Many were not working and recorded as such. The main reason for broken links was changes to external websites.
	References are checked	Since this is mainly extension literature very few references were quoted, except in the documents which are significant and lengthy publications. Checking the references within these was not practical, and it was considered that these would have been well checked at the time of publication.
	Any publication, manual or other external document that links with the page are noted along with publication date and publishing organization	All links were checked. Notes were not taken of publication date and publishing organisation.
3	Allocate reviewed pages to a topic/subtopic heading(s)	Completed
4	Maintain a file of all reviewed work (with track changes)	Completed

5	Compile an Excel spreadsheet of all pages, the name and contact information of the expert contracted, and recommendations. This is to be provided to the FutureBeef Advisory committee at a minimum of each quarter and on completion of the project.	Completed Meetings were held at approximately two month intervals with the Project manager and MLA representatives.
6	Review work to date with the new draft website structure topic headings and sub-topic headings. Allocation of pages to these relevant headings and updates where necessary.	At the conclusion of the project, all spreadsheets and other data have been returned to the Project Manager. This includes a few ongoing reviews which are waiting for responses from authors.

Throughout this project, regular discussions were held with the Project Manager and the responsible MLA staff. As the project progressed it became apparent that the content of most of the pages was very good, and they had been well vetted prior to publication. Most of the problems were broken links or simple editing issues. There were a number of documents which required extensive updating. These were not considered misleading; they just needed to take account of more recent advances in science and changes to the economic and policy environment. As it was beyond the scope of this project to rewrite these, they were identified for updating by the relevant agency whenever possible. The NT DITT has revised five of their documents in response to review comments.

Although some independent experts were consulted, in practice the best subject specialists to provide expertise on complex issues were often the original authors or their supervisors. Extensive discussions were held with a number of them.

While the review process was easier than expected, the restructure proved to be complex and more time-consuming. There was also a time factor in that the new structure had to be presented to the web technology company in time to make the changes before their contract finished in February 2022. There was therefore a change of emphasis putting more importance on the restructure rather than the review for much of the project period.

The project's scope was limited to recommending changes to be implemented by the FutureBeef team. Therefore the true success rate of the project will only be apparent when the changes are implemented and feedback from the users received.

3. Methodology

3.1 Review

At the start of the project, the project team was supplied with a spreadsheet totalling 730 entries which was used throughout the project to keep track of the webpages. Of these, 260 were in a section called *Knowledge* which were generally short articles or webinars, or a combination of the two, prepared specifically for the FutureBeef program. Most of these had multiple links to other webpages or documents, many of which were not working.

There were 139 pages in the *Documents* section which were direct links to existing documents. Although the distinction between the *Knowledge* and *Documents* sections based on their origin was understood, it was felt separating the extension information in this way was confusing for the reader and contributed to difficulties searching for information. The project team recommended that the distinction between the *Knowledge* and *Documents* sections be removed.

The *Projects* Section comprised completed and current projects. Twenty-two projects were identified as due for completion but were still recorded as current. Therefore the managers of all overdue projects were contacted for an update.

The reviewers sought external advice for a number of pages when specialist knowledge was needed. However as the website is mainly extension-orientated, the reviewers' own knowledge was generally sufficient.

Near the end of the project, a further 63 new pages were reviewed. These had been newly submitted to FutureBeef and had already been categorised into the new system. They have therefore been counted separately. These pages made the total up to 793.

3.2 Restructure

The reviewers proposed that information would be searchable in two ways, through a menu of topics and subtopics and through keywords. The number of different categories or types of page would be enlarged, but there would be no differentiation between Knowledge and Documents. The search function would apply across all webpages.

The original intention was that no list of topics and subtopics would include more than ten lines as that was judged to be a number the reader could comfortably look through. That plan was followed wherever possible, requiring three levels of subtopics. It proved impractical in all cases but the number of instances where the list of options exceeded ten were kept to a minimum.

Each page was allowed up to five keywords. It is proposed that the list of keywords be available on the website for the reader to look through, and thus an effort was made to standardise and minimise these. The original intention had been to keep keywords to under 100, but that proved difficult and the final list of keywords numbered 158. A list of synonyms for each of the keywords was prepared and it is hoped that this can be added to as the system is used. As an example, the keyword *Rotational Grazing* is linked to eight other names (spelling, cell grazing, time control grazing, HRM etc) that would each direct the reader to the accepted keyword.

4. Results

4.1 General

The review team was generally impressed by the quality of information in the FutureBeef pages. Although a number of papers were outdated, there were very few examples of misleading information. There were many cases of broken weblinks.

The structure of the website was confusing. Searching for information was difficult. Developing a new structure was not easy, and became a major part of the project.

4.2 Review

4.2.1 Overall recommendations

The overall recommendations for the review panel are as shown in Table 2.

Table 2: Recommendations from the review of FutureBeef webpages

	No change	Recommend changes	Replace when feasible	Remove	Could not find	Not reviewed	Totals
Knowledge	187	36	18	11	8		260
Documents	80	16	23	8	7	5	139
Projects	116	120		13	3		252
Tools & Services	67						67
Newsletters	12						12
New 2022	28	26			8		63
Totals	491	198	41	32	26		793

4.2.2 Pages recommended for changes

Although changes were recommended to about a quarter of the webpages, it should be stressed that most of the recommended changes were minor, the most common being links to other documents that were not working. This was particularly the case with the *Projects* section, where 60 of the recommended changes referred to the direct link to an MLA report not working, and a further 25 referring to other errors with MLA reports or summaries. The other common issue in the *Projects* section was projects that had passed their indicative finish date but had not been marked as complete, or that had no start and finish dates. The project managers of 22 projects in this category were contacted, and the entry updated. About half of those were complete and a link provided to the project's final report. The others were either extended or recently completed with no final report yet available.

There was a particular issue with access to many of the Northern Territory documents, because of changes to the Northern Territory Government website. These links are expected to be restored soon.

4.2.3 Pages recommended for removal

Very few documents were considered to be misleading. The 32 pages recommended for removal were mainly identified for other reasons. Some were written for specific periods which had passed, for example seasonal forecasts and government financial assistance schemes. There were also a number that the reviewers felt did not contribute useful information or were repeated in a better form elsewhere.

4.2.4 Documents recommended for replacement when feasible

The papers recommended for later replacement were those that were considered outdated but not misleading. It was recommended that they continue to be available on the FutureBeef website while the partner agencies were encouraged to provide suitable updated replacements as soon as possible.

The length of time before a document was considered out-of-date depended on the subject. Many of the documents recommended for replacement were genetics extension documents written over twenty years ago. The fundamental information in each of these documents remains sound, but they need updating to include some recent scientific information and changes to the market environment. In some cases the format and language should also be modernised. There were also papers from about 2010 based on economic data. Again the principles were valid, but the use of old financial data with outdated prices and costs reduces credibility. More recently, there were papers on soil carbon with valid data, but the context has changed significantly so some of the recommendations are no longer relevant.

The 41 documents recommended for replacement were selected because they addressed important issues. The reviewers acknowledged that it would be too time-consuming to constantly update all

FutureBeef papers, and considered that if all information was clearly dated then readers would be able to understand the context and use their own judgement.

4.2.5   Pages that could not be found

By the end of the project, 26 pages listed on spreadsheet could not be found. Some of these had not been found at all, while several were withdrawn over the course of the project. In a few cases the reason could have been an error within the title, but it appears that most had been removed as part of the FutureBeef team's own quality control measures.

4.2.6   Documents not reviewed

Review of the following five best practice manuals was not considered to be within the scope of this project. These are lengthy documents covering the whole range of cattle and rangeland subjects, and are now several years old. It is recommended that the respective agencies be asked to arrange for these best practice manuals to be edited and updated in the near future.

- Best management practice for the grazing of cattle in the northern pastoral areas of Western Australia (WA 2006)
- Cattle and land management best practices in the Top End region Part 1 (NT 2013)
- Cattle and land management best practices in the Top End region Part 2 (NT 2013)
- Cattle and land management practices in the Katherine region (NT 2009)
- Managing a beef business in the subtropics (Qld 2004)

4.3 Restructure

4.3.1   Categories

Fourteen categories or types of page were recognised. The previous categories of *Knowledge* and *Documents* were combined under the name *Documents*. Projects were split into *Completed Projects* and *Current Projects.* Each webpage could be entered as up to three different categories. For example there were webpages that contained *Documents*, *Webinars* and *Producer Case Studies*.

The full list of categories is given in Appendix 1.

4.3.2   Topics and Subtopics

The structure was based around six main topics; Grazing Land Management; Animal Production; Animal Health and Welfare; People and Business; Genetics; Markets and Processing; Other Resources. These in turn were broken down into up to three levels of subtopics. The subtopics chosen and the number of pages allocated to them is shown in Appendix 2.

Each webpage could be classified into either one or two topics/subtopics. For example pages related to drought could be concerned with issues under both *Grazing Land Management* and *People and Business*. It was accepted that some pages may be concerned with more than two topics, but adding more options would have meant more complexity.

All webpages were allocated to topics. Use of filters should allow the reader to choose between finding all types of webpage on the desired topic, or to narrow it down to specific categories. A reader interested in tropical forages for example could choose whether to see just the extension documents, or also the projects, tools, case studies and field guides on the same topic.

4.3.3 Keywords

The list of proposed keywords and some synonyms is attached in Appendix 3. An effort was made to use words in common use by industry. Some further development of the list of keywords and synonyms will be necessary as the system is used and feedback received.

5. Conclusion

5.1 Key findings

The reviewers concluded that the standard of information in the FutureBeef website was very high. Many of the pages had been reviewed in recent years and there was no evidence that agencies had allowed information to be placed on the website without adequate internal review. Although some changes were recommended to 36% of the pages, most of these changes were minor. Only 4% of the pages were recommended for removal, and a further 5% recommended for updating whenever possible.

There were many broken links, mainly related to changes to external websites.

The structure was not easy to navigate and to search for information. A considerable effort was made to devise a more suitable structure. It is not possible to tell how successful the new structure will be until it is implemented and feedback received from users. It is quite likely that further adjustments will be needed.

5.2 Benefits to industry

FutureBeef is the main source of extension information for the northern beef industry, and the FutureBeef website is the preferred source of online information for producers, extension officers and advisors. Setting this system up, and maintaining this level of cooperation across the north for ten years has been a major achievement. It is strongly recommended that FutureBeef continues to be supported by all the partners and is further improved. Some recommendations for further developments are given below.

6. Future recommendations

The project team's recommendations for the further development of the FutureBeef website are as follows:

1. *Widen the scope*: A large proportion of the content in the FutureBeef website has been supplied by the Queensland Department of Agriculture and Fisheries (QDAF). The NT Department of Industry Trade and Tourism (NT DITT) has contributed a significant but much smaller proportion, and the Western Australian Department of Primary Industry Regional Development (WA DPIRD) a smaller proportion again. It is easy to understand why QDAF, with its greater numbers and emphasis on extension officers, has and will continue to have the dominant role, but it is recommended that a greater effort be made to widen the scope with more contributions from the NT and WA, and more involvement from the university sector, CSIRO, landcare groups and producer organisations, all of whom have so far contributed very little of the extension information.

2. *Proactive sourcing of material:* Some of the best extension pages on the website were written by QDAF staff around 2011, clearly in response to an agency-wide effort. Since then there has been

an active webinar program which has produced some excellent extension information, but recent written documents have arisen out of research programs or appear to have been volunteered by individuals. It is proposed that the FutureBeef steering committee take a more proactive approach to determine the subjects needed to fill gaps in the information and useful documents that need to be revised, and arrange that this be done by negotiation with partner organisations.

3. *Culling redundant pages*: While the proposed ways of broadening the scope of the information may lead to more contributions, the project team believes that regular culling of pages that do not add much value should continue, and with appropriate consultation culling could become more rigorous. Thus there may be no need to enlarge the website much beyond its current size, almost 800 webpages.

4. *Archiving*: When removing documents, it is important that the information is not lost. There was feedback from some authors that FutureBeef should establish an archive. It may be more appropriate for the individual jurisdictions to undertake that task, but since FutureBeef has become the main repository of extension knowledge for the northern beef industry, it is recommended that FutureBeef coordinate the archiving of old material.

5. *Projects*: The *Projects* section is extremely valuable for researchers, extension officers and industry. It is kept up-to-date for externally funded projects. At least 68% of those recorded are MLA projects. It is apparent that each of the partner agencies also has valuable internally funded projects, not all of which are included on the website. There are also projects run by other agencies that are not recorded. If an effort was made to include all projects, that would help to coordinate research and avoid duplication and repetition.

6. *Final reports and summaries:* Within the *Projects* section, all completed projects should have a link to a final report or other publication that sums up the methodology, results and conclusions of the trial. Although this project managed to track down several final reports, there are still some completed studies without them. Project pages should also have easy access to a summary as some titles are not clear and do not explain what the project was about. Most, but not all, MLA projects had links to summaries on the MLA website. Most non-MLA projects had written summaries on their FutureBeef page, but again not all.

7. *Numbering*: Currently webpages are not numbered, and many titles are similar. Therefore in the process of reviewing and restructuring, the project team had to institute its own numbering system. Numbering may not be relevant for the readership but for the continuing process of reviewing and renewal, providing each webpage with a unique identifier would be very useful.

8. *Dates and Authors*: Most webpages have dates and authors recorded. In some cases these are positioned prominently. In other cases they are in small script at the end, and in some documents and projects that information can only be found by downloading the document. The project team believe this information should be as overt as possible, as a way of informing the reader how up-to-date the information is and how much reliance should be placed on it. This may avoid some of the negative feedback that prompted this review to be started in 2021.

9. *Further information*: A mechanism is needed for readers to seek further information from the authors of webpages. This issue was raised with the FutureBeef team during the course of the project, and it was decided that rather than the author's contact detail, each page would have the email address of FutureBeef info@futurebeef.com.au for further enquiries. This is a satisfactory solution, avoiding issues when authors leave their positions, and avoiding possible privacy issues from having individual's details on a public website.

7. References

James, J & McIntosh, F (2017) 'Delivery of FutureBeef website and webinars'. MLA project E.INV.1412

8. Appendices

8.1 Categories of webpages

- Best Practice manuals
- Completed projects
- Current projects
- Documents
- Field guides
- Links
- Maps
- Newsletters
- Other industry sites
- Producer case studies
- References
- Services
- Tools
- Webinars

8.2 Topics, subtopics, and the number of pages in each

Main categories

- Grazing Land Management

- Animal Production

- Animal Health and Welfare

- People and Business

- Genetics

- Markets and Processing

- Other Resources

Grazing Land Management

			Knowledge	Documents	Projects	Tools	Total
Fire			5	3	1	1	10
Grazing management	Best practice		3	7	6		16
	Pasture condition		1	6	2		9
	Rotational grazing		1	1	3		5
	Planning		2	1			3
	Stocking rates & pasture utilisation		10	2	3		15
	Decision support systems	FORAGE	7		1	1	9
		Mapping tools	1			1	2
		Other pasture tools			2	3	5
	Monitoring		1	1	2	2	6
	Self-herding				2		2
	Station development			1	3		4
	Grazing adaptation to climate change		2	1	3		6
	Reef Protection			5	12		17
Improved pastures	Pasture dieback		2	2			4
	Pasture rundown		3		2		5
	Pasture legumes		2	2	5		9
	Leucaena		2	2	13		17
	Forages		2	2	3	1	8
	Sown pastures		3	6	7	1	17
	Pasture grass species		1	*1*	1		*3*
Soils	Soil conservation			2	3		5
	Soil health		3	1	1		5
	Soil carbon		1	3	2		6
	Soil nitrogen				2		2
	Fertiliser				3		3
Weeds	Weeds in pasture & fodder		3	5	1	1	10
	Woody weeds			1	7		8
	Weed risk		1		1	1	3
Land types			24	1		1	26
Climate			5		2	3	10
Native pasture management	Pasture species		8	2		1	11
	Regulation		1				1
	Pasture maintenance		4	1			5
	NRM		1	2			3
	Woodland		2	2			4
	Biodiversity			4	1		5
Photo standards	Qld		14	2		1	17
	NT			3			3
	Drought resilience & recovery		7	5	2		14

Natural Disaster recovery	Flood recovery		2	5			7
	All forms of natural disaster		1				1
Remote Management Systems					8	1	9
TOTAL GLM			**125**	**82**	**104**	**19**	**330**

Animal Production

			Knowledge	Document	Projects	Tools	Total
Breeders	Cow reproduction	Measuring & using reproduction data	2	1	5		8
		Options for improved reproduction	6		1		7
		Demonstration & training	1				1
		Body condition score	2				2
	Heifer reproduction		1	1	1		3
	Mortality		2		1		3
	Nutrition		1				1
Growth paths			5	2	6		13
Calf rearing			1				1
Calf survival			9		5		14
Feedlots	Feedlot environment			1	8		9
	Feedlot nutrition		4	2			6
	Managing cattle in feedlots		2	1	2		5
Nutrition	Compensatory growth		1				1
	HGP		2	1	1		4
	Minerals	Phosphorus	6	3	5	1	15
		Other minerals	1				1
	Requirements		4	1	1	2	8
	Supplement composition		2				2
	Supplement energy		4	3	1		8
	Supplement protein		2	3	6		11
	Water		2	1			3
	Rumen detoxification				1		1
	Feed composition		6			1	7
	Crisis feeding		2	1			3
Methane	Methane reduction strategies				16		16
	Measuring methane emissions				5		5
Weaners			7	3	3		13
TOTAL A/Prod			*75*	*24*	*68*	*4*	*171*

Animal Health and Welfare

			Knowledge	Document	Projects	Tools	Total
Animal health	Disease	Disease reviews & surveys	1		3	1	5
		Specific diseases	4	2	7	1	14
		Poisonous plants		1	1		2
	Parasites	Ticks & other external parasites			10	1	11
		Internal parasites	2	1	2		5
	Vaccination		2		1	1	4
	Diagnostics		1		3		4
Transport			3	4	1		8
Welfare	Welfare standards		3	1	3		7
	Husbandry		4	1	1		6
	Pain relief		2	1	3		6
	Crisis feeding		1	1			2
Residues			1		1	2	4
Wild dog control					2	1	3
Animal Biosecurity						6	6
TOTAL AH&W			*24*	*12*	*38*	*13*	*87*

People and Business

			Knowledge	Document	Projects	Tools	Total
Farm Management Economics	Economic assessment of development options		9	1	1		11
	Economics of production systems		6	5	1		12
	Business performance		2		2		4
	Budgeting tools		2		3	5	10
Infrastructure			3	4	1		8
Decision support systems			3		2		5
Natural disaster resilience & recovery	Economic management during drought		5	3	10	1	19
	Flood recovery assistance		2				2
	All forms of natural disaster		1			1	2
Capacity building	Producer capacity building	Demonstration			5	1	6
		Mentoring & training	4	1	1	1	7
		Leadership			1	2	3
	Extension methods & training			1	10		11
Staff			2	6		2	10
Management of R&D					2	2	4
TOTAL P&B			*39*	*21*	*39*	*15*	*114*

Markets and Processing

		Knowledge	Documents	Projects	Tools	Total
Processing		7		0	1	8
Domestic markets	Meat quality	1		6	1	8
	Meeting market specifications	2		4		6
	Market decision-making	5	1	1		7
	Environmental markets			2		2
	Market data				1	1
Export markets		3	3	1	1	8
TOTAL M&P		*18*	*4*	*14*	*4*	*40*

Genetics

		Knowledge	Documents	Projects	Tools	Total
Bull selection and management		5	2	2		9
Genetic improvement	Improving genetic traits	4		9		13
	Understanding breeding & genetics	5	3			8
	Future genetic opportunities			2		2
	Genetic research & extension services			2	2	4
Practical breeding management		3	1	4	4	12
Genomics				8	1	9
Contraception				2		2
TOTAL GENETICS		*17*	*6*	*29*	*7*	*59*

Other Resources

	Knowledge	Documents	Projects	Tools	Newsletters	Total
Best Practice manuals		4		1		5
Industry surveys		2		1		3
General newsletters					10	10
General resources				5		5
TOTAL OTHER RESOURCES	*0*	*6*	*0*	*7*	*10*	*23*

TOTALS

	Knowledge	Documents	Projects	Tools	Newsletters	Total
Grazing Land Management	125	82	104	19		330
Animal Production	75	24	68	4		171
Animal Health & Welfare	24	12	38	13		87
People & Business	39	21	39	15		114
Markets & Processing	17	6	29	7		59
Genetics	18	4	14	4		40
Other resources	0	6	0	7	10	23
TOTAL	*298*	*155*	*292*	*69*	*10*	*824*

Totals exceed the number of pages on the website as some pages cover several topics.

8.3 Keywords and synonyms

Keywords	synonyms						
abattoirs	slaughter	processing	meatworks				
adult equivalent	AE	animal equivalent					
age	teeth	aging					
agistment	leasing						
agronomy							
AI	artificial insemination	semen storage					
algae	algal ponds						
animal health	disease						
arid zones	desert						
behaviour	temperament						
best practice	BMP						
biocontrol	biological control						
biodiversity	conservation						
biosecurity	exotic diseases	exotic pests	exotic plants				
breeder management							
body composition	carcase composition						
body condition	condition score	BCS					
bovine respiratory disease	BRD	pneumonia					
buffel grass							
bull management	bull soundness	BBSE	semen quality				
bull selection	bull buying						
business	business decisions	debt	banks	loans			
calf loss	perinatal	calf mortality	colostrum				
calving distribution	calving patterns						
carcase traits	carcass traits						
Cashcow	cash cow						
catchment	flooding						
cattle breeds	wagyu	brahman	hereford	angus			
cattle handling	livestock handling						
channel country							
chemicals							
climate	climate change	probability of rainfall	meteorology	weather	forecast	seasons	BoM
conservation	nature conservation	wildlife					

crops	sorghum	legume crops				
cross-breeding	hybrid vigour	heterosis	criss cross	cross breeding		
data management	spreadsheets	databases	data collection			
decision support	DSS	breedcow	dynama			
disease	illness	infection	ill-health			
dog	wild dog	dog diseases	canine	dingo		
drought	dry spells	drought feeding	drought management	crisis feeding		
dry season	winter					
E technologies	virtual fencing	smart eartags				
economic analysis	assessment	evaluation	benchmarking	financial analysis		
energy	metabolisable energy	energy sources				
environment monitoring	feedlot environment	heat stress				
erosion	gully erosion	soil run-off	run-off	soil loss		
extension	adoption					
faecal NIRS	NIRS	near infrared	diet quality			
farm dams	dam construction	earth dams	dams	water storage	turkey nest	
farmer health & welfare	mental health	stress	financial stress			
feed budget	pasture utilisation					
feedlot management	intensive production	fattening	heat stress			
fertiliser	fertilizer	super phosphate	fertiliser regime	fertilizer		
fire						
flood recovery	disaster support					
floodplain						
forages						
genetics	genomics	animal genetics	Breedplan	DNA	EBV	
goats						
grain	sorghum	barley	wheat	corn	maize	
grasses	grass species					
grazing management						
great barrier reef	barrier reef	catchments	GBR	reef		
ground cover	water infiltration	soil carbon				
growth	liveweight gain	live weight gain	seasonal changes in growth			
growth paths	liveweight gain	live weight gain	seasonal changes in growth			

hay	centre pivot						
heifers							
herd rebuild	restocking						
herd structure	herd rebuilding	age at turnoff					
HGP	regulations	growth promotants	implantation	hormones			
husbandry	dehorning	castration	branding				
improved pasture	sown pasture						
industry leadership	cattle council	farmer groups	representation	NTCA	Agforce	KPCA	
industry survey	cattle industry survey	pastoral survey					
intensification	paddock size	station design	access to water	grazing distance			
irrigation	pivots	underground aquifers	water harvesting	water use efficiency			
lactation	milk production						
land condition	pasture condition						
land rehabilitation	mining						
land systems	land types						
legumes							
Leucaena	mimosine	rumen bug	Leucaena establishment	DHP	psyllids		
ley systems	cropping						
live export	Philippines	regulation	Indonesia	Vietnam	SE Asia	ESCAS	
livestock transport	fit to load	trucking	regulation	road trains			
maps	mapping						
marketing	selling	sales					
meat quality	P8	fatness					
methane	greenhouse gas	GHG	carbon dioxide	emissions			
minerals	phosphorus	trace elements					
mitchell grass	mitchell grassland	mitchell plains	western Queensland	Barkly			
mortality	death	death rate					
MSA	meat quality	market assurance					
mulga	drought feeding						
native pastures	unimproved pastures						
nitrogen storage	soil nitrogen	N storage	soil N	biocrusts			
NLIS	smart tags	data recording					

NRM	natural resource management	conservation					
Northern Territory	NT						
nutrition							
P nutrition	phosphorus	minerals					
pain relief	pain management	husbandry					
parasites	drenches	external parasites	internal parasites	tick-borne diseases	hydatid	worms	ticks
pasture dieback							
pasture condition	land condition						
pasture establishment	no-till						
pasture monitoring	pasture condition	monitoring					
pasture resilience	pasture condition						
pasture rundown	soil nitrogen						
pasture species	flora	pasture composition					
pests	ferals	feral animals					
plant breeding	plant genetics	germplasm					
protein							
PTIC cows	pregnant cows	Preg-testing	pregnancy testing				
Queensland							
regulations	legislation						
remote technology	virtual fencing	walk-over-weighing	satellite monitoring	walk over weighing			
reproduction	breeding	cow production	cash cow	Embryo transfer	bull testing	heifer critical weight	BCS
research facilities	research stations	research farms					
research management	priority setting	R&D	RD&E	RDE	RDEET		
residues	chemicals	pesticides					
rotational grazing	time control grazing	cell grazing	holistic resource management	wet season spelling	spelling	short duration grazing	HRM
rumen	rumen development	rumen bacteria	oesophageal groove				
safety	staff management	compensation	risk assessment	OH&S	WH&S		
salinity	salt	sodium	water quality	soil salinity			
SE Asia	Indonesia	Vietnam	Live export	Malaysia			

self mustering	spear gates	drones	auto-drafting	self herding			
sheep							
silage							
soil carbon							
soils							
spreadsheet tools	computer tools	internet tools					
staff	employees	stockmen					
stock security	cattle theft						
stocking rate	utilisation	carrying capacity					
supplements	dry season supplements	wet season supplements	licks				
supply chains	value chains	market chains					
telecommunications	telephone	mobile coverage	internet	satellite phone			
temperament	temper	behaviour					
toxic plants	poisonous plants	indospicine	Pimelea				
trading	buying and selling	trade cattle					
training	courses	mentoring					
turn-off	turn off						
urea	NPN	water medicators	dry licks	molasses urea	M8U		
vaccination	injection	vaccine					
vegetation groups	vegetation types	land types					
walk over weighing	critical weights						
water	water quality	water requirements					
weaners	weaner management	weaner training	weaner nutrition	early weaning	radical weaning		
weaning	early weaning	radical weaning					
weeds	weed management	weed control	woody weeds	exotic weeds	WONS	toxic weeds	
welfare	cruelty	regulations	drought	fit to load	duty of care		
Western Australia	WA	Kimberley	Pilbara				
woody thickening	shrub growth	re-growth	woody weeds				
woodland	woodland management	woodland condition					
wildlife	marsupials	endangered species					
yards	yard design	ramps	crushes	drafting	shade		