

## ***The Dairy Fertility Investigator: blogging as a digital extension platform for agriculture***

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**Abstract.** The Dairy Fertility Investigator blog is a pilot digital extension platform aiming to engage farmers interested in dairy reproductive management and to promote diverse industry resources. It will also be used to test and explore digital content creation and curation processes within an extension context. As expected in developing a new type of digital extension program, there have been challenging technical aspects as well as organisational barriers to consider. It has been essential to engage with both internal and external stakeholders to gain acceptance. To this end, comprehensive governance guidelines have been established. A diverse support team has also been formed to address risks and potential problems. The aim of this paper is to outline the development process, as well as report preliminary evaluation results providing an early indication of how well this blog serves as an appropriate medium for communicating with farmers.

**Keywords:** dairy, fertility, blog, digital, extension, development, knowledge management

### **Introduction**

The Dairy Fertility Investigator is a pilot digital extension platform aiming to engage farmers interested in dairy reproductive management and to promote diverse industry resources. It was developed as an 'exemplar' project by Animal Performance extension and development officers in conjunction with the Dairy Knowledge Management Team within the Department of Economic Development, Jobs, Transport and Resources (DEDJTR; formerly known as the Department of Primary Industries).

The majority of DEDJTR's dairy extension work is done by facilitating adult learning in groups, networks, workshops and seminars. As we do not compete with commercial interests, we do not focus on providing one-on-one consulting services. Instead, we work in partnership with service providers who are able to provide individual advice to farmers in a competitive market environment. We also provide technical information through the farming press, by publishing regular articles on diverse topics in regional newsletters, newspapers and magazines.

We are well-established within this space. However, as farmers become increasingly time poor and internet access becomes ubiquitous, digital extension methods are attracting increasing interest across agricultural industries.

The first reason for this is that traditional extension methods such as workshops, seminars and discussion groups attract only a small subset of the farming population. Waters et al. (2008) found that there are significant segments of Australian dairy farmers that are averse or unlikely to use workshops or discussion groups as a primary source for information. According to their research, 5.5% of farmers fall into the 'Family first' category, which tends to be self-reliant in their information-seeking behaviours, while 24.9% are 'Established and stable' and have an aversion to other farmers and discussion groups as information sources. Although traditional extension methods remain indispensable for both information delivery and strong intangible benefits (community-building, social connectivity, catering to kinaesthetic learners), it makes sense to explore alternative ways of delivering information to farmers.

Secondly, with younger generations of dairy farmers taking over family farms, the industry is becoming increasingly technologically savvy. In 2005, the Department of Agriculture, Fisheries and Forestry undertook research on the information needs of young farmers (DAFF 2005). This highlighted that the most important sources of information for this group were web-dedicated agricultural search engines followed by magazines. It also recognised the need for information with local content, specific to farming regions and relevant to farming sectors. According to Waters et al. (2008)'s segmentation study, the 21.5% of farmers that are 'Open to change', had high rates of reported 'daily' use of the internet to manage their businesses.

With this in mind, we have sought to build a platform that would harness the benefits of social and digital media. This project is not designed to replace traditional tried-and-true extension methods or to decrease our involvement with publications and the farming press – instead, it seeks to expand our presence across diverse information mediums, and to ensure that for farmers using the internet as a primary source for data, there is a source of information available that is reliable, scientific and specific to the Australian dairy industry.

### Digital options – or, why a blog?

It would have been fairly simple to create a static website which could house tech notes or case studies focusing on fertility. However, we thought that this would be a lost opportunity to capitalise on the real strength of internet connectivity.

'Social media' are tools that allow people to 'create, share and exchange information, ideas and pictures/videos within virtual communities and networks' (as defined by another social-media driven website, Wikipedia). This is more in-line with our concept of extension, where farmers attend workshops and events to learn from one another just as much as they learn from a speaker or facilitator. Malouf (1994) considered two-way communication as a key element in extension and Fell (1996) agreed that learning activities should be participatory and acknowledge the experience and expertise within the audience. In accordance with this, social media encourages dialogue between participants and helps us to avoid 'lecturing' farmers about what they should or shouldn't be doing – something that is not conducive to technology adoption or practice change.

There are many potential social media formats to choose from, including Facebook, Twitter and YouTube. Our preferred choice was to develop a dairy blog. Reproduction is a complex issue with a wide range of topics to consider, including key management areas such as heifer rearing and bull management, advances in technology and genetics, and research into synchronisation and chemical interventions, and scientific trials. The large variety of reproductive systems and strategies available for discussion means that restricted formats such as Twitter (where users are limited to 140 characters per 'tweet') and Facebook (which is designed for quick, brief updates) are unable to convey sufficient depth of information to suit our purposes. YouTube is an excellent format for information delivery, but requires specialised skills and equipment that the team does not currently possess. Also, the blog still allows us to link to other videos if so desired.

Blogs have two characteristics in particular which make them the ideal choice for agricultural extension.

The first advantage is that of *timely information*. We currently distribute articles via the farming press, which has a wide readership and provides a good means of delivering information to readers. However, current methods involve a lengthy (minimum one month) delay between idea, development and delivery. Each author must predict issues a month in advance and has no means of addressing current trends, so we appear slow to react to pressing problems. Having a blog enables the team to have a fluid, rapid approach to seasonal issues, technological developments and industry news.

The department also uses technical notes and factsheets to disseminate information. Although a valuable resource, these require constant maintenance to keep current. A blog works to combine factsheet and news, embedding information into a chronological context which remains accessible via archive but makes no promises as to current validity (although, authors are able to update old articles, or to link them to newly updated ones as necessary). Blogs also offer the opportunity to 'tag' articles into relevant categories (e.g. *new research and technology, features farmer case studies, industry news, etc.*).

Finally, the blog is able to host a large variety of article formats including technical articles, seasonal warnings or updates, event recaps, 'top tens', etc. It can also host visual information like videos, links, images and webinars. Through these interactive media and through the opportunity to comment on posts, the blog encourages engagement. Hunt & Coutts (2009) found that amongst farmers that are actively engaged with industry programs, 97% improved their background knowledge by reading newsletters, compared with only 13% of farmers that were not engaged with industry programs.

This leads to the second major advantage, which is *connection*. Blogs are not a one-way means of delivering information. Reader interaction is a core feature of a successful blog, allowing farmers to seek clarification by commenting on articles, to write in via email for further information, to share their own experiences with other farmers, or to request future articles. Authors or case study farmers could also interact with readers by answering comments, putting up polls, asking questions or encouraging guest writers to contribute.

In blogs where active readership is built, a forum could also be added allowing readers to form communities of like-minded individuals. Reader communities tend to self-select, offering a ready-made group of interested individuals who would be receptive to information about dairy cow reproduction or events in a similar theme. Readers would have different levels of expertise,

and could help each other with suggestions based on their experiences in similar practical contexts.

Blogs also offer a means of linking to other organisations (Dairy Australia, Australian Dairy Herd Improvement Scheme, etc.) and relevant articles on other websites. A blog is much more flexible than printed media, and by offering it as curated source of information, we allow readers a central place to find legitimate and independent material. Links also go both ways – by other organisations linking to DEDJTR original information, we can help increase our industry exposure on a global scale.

### **Good governance**

Once this idea was developed, it was taken on by the DEDJTR Dairy Knowledge Management Service (KMS) team. The KMS team aims to improve collaboration and access to DEDJTR content and the delivery of digital products and services for the dairy industry. Team members have expertise in a wide variety of areas, including digital delivery, networking and user focused instructional design. They focus on sustainable development and delivery methods, and have a great deal of experience in building IT and governance frameworks for people to work with and within.

While it is entirely possible for an individual to build and maintain their own blog, as an official information platform for a government organisation, we needed to 1) have a plan for managing risks associated with a new, untested type of extension activity, 2) ensure that the blog received organisational support from internal sources (i.e. our communications team) and external sources (i.e. our main co-funder, Dairy Australia), 3) ensure that the blog received project support, with time allocated to writing and development, and 4) ensure that the blog received full technical support to create a polished and professional product.

The best way of accomplishing these goals lay in building good project governance documentation and assembling a group to oversee site governance. A proactive, iterative approach to governance assists with stakeholder engagement (internal and external), helps assuage concerns and is a living document reviewed and updated at each site governance meeting. Our governance documentation outlines essential project management considerations such as: roles and responsibilities for each member of the site governance group, a timeline and description of each phase of the project, metrics and evaluation methods that will be used to measure success, key target audiences for the blog, site management principles, editorial calendar and post types, verification workflows, communication strategy and issue management.

Having the right people involved in the site governance group is also essential, providing access to input from both internal and external stakeholders. The group has a broad skill base to draw upon, spanning technical expertise, project management, social media/communications, digital knowledge and information design. It oversees phase development of the site, receives the bi-annual evaluation report, approves re-development initiatives, communication and engagement plans and the annual content schedule, and finally, oversees decommissioning if required.

### **Technical development**

Once a format had been chosen and a governance plan developed, the blog itself needed to be built. In our case, DEDJTR's digital delivery specialist was able to provide technical support, but an individual with a moderate comfort level with computers would be able to create a basic version of the product.

Popular platforms (including Blogger, Tumblr and LiveJournal) are freely accessible to anyone with an internet connection, and numerous guides are available on how to use these. We chose to use WordPress as our preferred platform, as it's powerful, free, and would allow us to package and port the blog to another platform if necessary. This is the process we used.

1. Obtain a domain and hosting. A domain is the URL or address of the website. This has to be unique, and should be chosen carefully. Ideally, it is relevant to the content and should also be short and easy to remember. For these reasons, we ended up choosing [www.dairyfertility.com.au](http://www.dairyfertility.com.au). A host is where the website physically sits. Buying hosting gives you a place to store your website files and allows you to connect your website to the internet. Hosting for the site was established on a software as a service (SAAS) cloud server rather than an in-house server, complying with best practice for distributed digital delivery.
2. Decide on a theme. A theme dictates the look and feel of the blog and overlays a framework, which provides functionality. Although free versions can be found, we thought it was worth purchasing a professional theme and framework (in our case, the 'Metro' theme and Genesis Framework from StudioPress). Doing this made sure that we would have a fast and mobile-

- responsive website. It was also easier to adjust the appearance of the blog to match our needs – something simple, attractive, and easy to navigate and read.
3. Tracking. As a pilot project, we aim to collect a large amount of evaluation data, including: how many people visit the blog, how many return to it, and how people discover it. The most powerful tool available for doing this is Google Analytics – a free service that can be organised to track the metrics of any website. It must be set up to filter out spam, as well as Google crawler and DEDJTR staff visits, in order to obtain accurate metrics. We also set up a subscription service to the blog so that visitors could opt to receive automatic notifications for new posts. MailChimp (a SAAS electronic direct marketing solution) allows us to see who signs up to the blog, to segment our audience into farmers and service providers, and to track our most popular articles. This helps us adapt the blog to better match our audience's needs.
4. Plugins. WordPress allows bloggers to customize their accounts using plugins. These are tools that expand your use of the website, either by streamlining moderation (for example, Akismet allows automatic filtering of comments), improving ease-of-use or by adding new features, such as forums and widgets (including comment tracking, tags, word clouds and calendars).

## Content

Writing for a blog is not the same as writing a technical article for a newsletter. As government extension officers, the technical articles we write are deliberately neutral – as appropriate for our organisation. However, a blog allows readers to connect with the author, who writes in their own 'voice' from a personal point of view. Readers should feel like they are conversing with the author and discussing opinions and experiences. We make an effort to ensure that articles are driven by science and factual information. However, we also make an effort to make them humorous and entertaining, to make sure that people enjoy reading what we have to offer. We believe that a successful blog requires excellent writing skills, from someone with a good grasp of the appropriate style. It also needs a dedicated author for post consistency, and to ensure that a regular post cycle (as outlined in an editorial calendar) is complied with.

We are still experimenting with what kinds of posts to write. As we collect information about the most popular posts over time, we can adapt our content to match our readers' needs. The main blog post types we use at the moment include:

- 'Science' articles, which focus on research outcomes, summaries of newly published papers, etc.
- 'Experience' articles, which focus on feature farmers, case studies, etc.
- 'Alerts and updates', including fertility news, events and conferences/workshop outcomes.

This may change as the blog continues to evolve.

## Organisational acceptance

Writing for the blog requires the author to balance being personal and representing their parent organisation(s), in this case, DEDJTR and Dairy Australia. The blog must be engaging and entertaining. However, it must also avoid excessive controversy, be independent and not seen to promote commercial interests, and stay in-line with industry messaging. Establishing appropriate oversight was critical, with dual post sign-off protocols put in place to ensure that both organisations were satisfied with proposed content.

Engaging socially with the public can also represent a risk. For example: we are not able to provide individual advice to farmers, as we don't know each participant's unique situation, there is a risk that blog posts may contain inaccurate information, and we have to screen out inappropriate or inflammatory comments. Case study farmers could potentially be the target of criticism.

Strong governance protocols were key to managing these risks and assuring our parent organisations that we had a process for dealing with potential incidents. The establishment of the site governance group was also important in terms of oversight and ongoing management – its composition was carefully constructed to include technical and social media expertise.

## Evaluation

One of the goals of the pilot program is to test the appetite of dairy farmers and service providers for this method of extension. As with any new initiative, the project will be evaluated after a reasonable trial period. The current aim is to assess the reach and success of the blog in December 2015 and make the decision whether to continue with the next phase of development.

Without sufficient precedent, it's difficult to set benchmarks for this type of extension activity. There are a few extension blogs available for comparison: iaTURF and Turf Disease Updates (Jones et al. 2011); The Garden Professors (Gillman et al. 2011); Dryland Pastures (Moot 2014); and AllAboutBlueberries (Attaway et al. 2012), but none that we are aware of in Australia, and none in dairy that have reported evaluation results.

Our target audience is highly specific: dairy farmers who are particularly interested in dairy reproduction and are keen information seekers. We are not entirely certain how many people a subject-specific blog should attract to be considered successful, or how many views or sessions are required to ensure that we are making a noticeable impact. It's also difficult to record practice change that comes about as a result of the blog – how do we know what people are doing, and how successful the changes have been? These questions are still under discussion as we collect readership data and improve our understanding of how the blog is and should be used.

Site visits, page hits and session behaviour are monitored by MailChimp and Google Analytics. The blog was officially launched on May 12<sup>th</sup> 2015 and as of June 25<sup>th</sup> 2015, 11 posts have been published. Fifty-five people have subscribed to receive direct email updates, including farmers (n=16), service providers (n=25) and 'other' (n=17; some are across multiple categories). Overall, 1,585 users have been recorded, with 1,806 sessions and 2,922 page views. The average number of pages per session is 1.62. A user is defined as a unique visitor to the website. This is reasonably reliable as Google Analytics uses cookies to track unique visits, but it will double-count people under certain circumstances -for example, if they use multiple devices to access the site. A session is defined as a single continuous period spent on the website, and can include multiple page views. If the person closes the page and returns later, this is counted as a separate session.

There are 31% of sessions (566)recorded as having taken place in Australia, and a surprisingly large number of casual users from the United States (39%, 696 sessions). This does not necessarily mean that we are attracting a vast number of American farmers and service providers – it's possible that this could include 'phantom' hits from non-genuine users (computer programs known as 'bots' are sometimes used to systematically trawl through the web looking for marketing opportunities). Other hits are recorded from China, Japan, New Zealand and Germany.

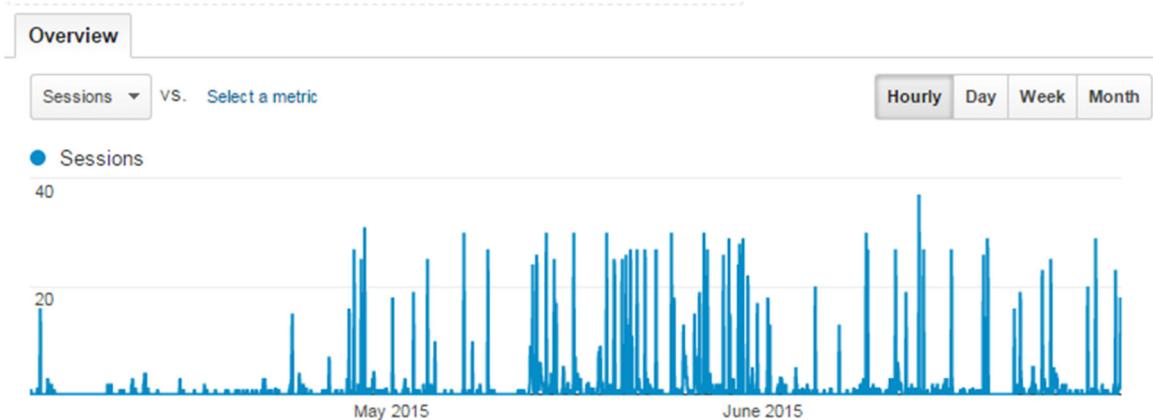
Currently, keywords listed as having led viewers to the blog through organic searches are: '*does the chemical roundup affect your female fertility*', '*blood test ketones cattle*', '*dairy fertility investigator*' and '*the great cliff*(sic)'. This latter search term relates to the most popular post, which has been '*Weaning at 5 weeks: the great calf rearing experiment*' (a feature farmer case study). The second most popular post to date is '*Three new ADHIS indices: what do they mean for you?*'. The popularity of this post demonstrates the blog's ability to direct readers to existing content and raise awareness of initiatives launched by other industry organisations.

According to Google market research, people who read the Dairy Fertility Investigator also tend to be 'Movie Lovers', 'Technophiles' and 'News Junkies & Avid Readers'.

There are difficulties in interpreting results. Apart from the lack of benchmarks, there is a possibility that some of the data may be inaccurate. We believe it is more reliable for us to track statistical trends rather absolute numbers. The blog was established on 1 February 2015 and a promotional launch was conducted in May 2015, with an increase in viewing sessions and sustained interest as a result of this (Figure 1). We are also confident that our MailChimp results are genuine, as each subscriber records their email address in order to participate.

As the blog continues to grow, our objective is to maintain reader engagement. We aim to post content fortnightly, which can be difficult due to the necessity of delivering on other extension commitments. Time input has reduced since the development stage, which involved writing concept briefs, meeting stakeholders, setting up governance processes and building the website. At the moment, posts usually take either half a day to a full day to write, with additional time for editing and approvals. This changes depending on how involved the post type is – a quick update or link to a video can take as little as twenty minutes, whereas a case study requires half a day to interview the farmer and another full day to edit and transcribe. The science-focused posts are on the longer end of the spectrum as well, as research papers take time to read and process, and require a lot of fine-tuning for the sake of accuracy. Surprisingly, post formatting takes half a day to a day – almost as much time as writing the content itself. This is because it requires sourcing useable photos and images (either created by staff or available under Creative Commons), as well as fixing the way the text appears on the website.

**Figure 1. Screenshot taken from Google Analytics page showing an increase in frequency and number of sessions since the blog was officially launched in May**



Spontaneous qualitative feedback from participants has been very positive so far, with subscribers saying, 'I have just had a look at your blog. This was the first time ever I have ventured into one and would like to congratulate you on the excellent layout and content' and 'I really love the blog that has been developed. It's fun to read!'

### Conclusion

By having strong project planning and governance controls, it has been possible to establish a blog within a government extension setting. Two essential factors have been good technical support and excellent writing skills – the blog has to be attractive and responsive, and the content must be informative and engaging. It also requires constant content creation and someone dedicated to this task. Early indications suggest that there is interest in this form of communication. We are hopeful that the blog will continue to expand and grow, and will report on further results at APEN 2015.

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