Applying Digital Agriculture to Address Consumer Sustainability Concerns in Food Production

Executive Summary

SAI Platform Australia initiated a research project in early 2016 on how emerging technology for farm management can also be used to give consumers greater confidence in the farms that produce their food. To address the question, consultants interviewed almost 40 Australian and international stakeholders across food, agriculture, fishing, aquaculture, sustainability, consumer rights and technology fields, as well as reviewing key literature sources and case studies. A final report is available to SAI Platform Australia members via http://www.saiplatformaust.org/.

The Opportunity of Digital Agriculture & Consumer Engagement

The rise of digital agriculture over the last decade is being hailed by many as a 'third revolution', offering opportunities for increased productivity and transformation of supply chain relationships, among others. While the benefits, impacts and applications of digital agriculture continue to emerge in Australia and around the world, application of these technologies to engage more directly with Australian consumers has been limited to date.

Understanding Current Deployment of Digital Agriculture Opportunities

Applications	Initiatives in Australia	Features
Radical Traceability (Producer to Consumer)	Limited activity	❏ Provides consumer directly with information such as country or region of origin, location of producer, 'meet the farmer/animals' ❏ 'Claims' / data is largely values free, easy to understand and interpret ❏ QR codes, RFID, apps, video feeds
Enhanced Transparency (Producer to Customer, Regulator, NGO, Standards Body)	Some activity & growing	❏ Data is interpreted by 'intermediaries' and represented to consumers through these filters ❏ Information types include animal welfare, labour rights, environmental impacts ❏ Data requires interpretation, context, assessment -- & often is values laden ❏ 'Trusted actors' provide the consumer with information, claims they understand or believe
Digital Data Platforms for Continuous Performance Improvement (Producer for themselves, Customers)	Predominant area of activity	❏ Data primarily used by producers themselves, and their customers, to track and improve on-farm management practices and productivity. ❏ Sheer volume of data and metrics make it hard for producers and customers to interpret and understand - let alone consumers ❏ Data is most useful in providing 'trend lines' of enhanced performance over time - which may in time be what eventually informs consumer facing information

The current situation looks likely to change to be far more consumer-oriented over the next 3 to 5 years. This shift will result from greater maturity of technologies and their applications in some industry segments, rising consumer interest and demand, and recognition by stakeholders that there is likely significant value creation for agricultural businesses in consumer engagement.

Traceability the Starting Point

Digital agriculture's enabling of 'Radical Traceability' seems to be the starting point for consumer engagement on their sustainability concerns, for 3 reasons:

1.   for food safety reasons, many food producers have implemented traceability systems, which provides a technology and data set from which to leverage;
2.   traceability speaks to provenance, which ranks highly in the consumer hierarchy of drivers for purchasing choices, and consumers tend to associate multiple attributes such as food safety, healthy food, freshness, quality, etc. with provenance information;
3.   traceability information can also be augmented with broader narratives and supporting data to provide detail on performance as it becomes available.

In the area of Enhanced Transparency, various stakeholders see significant opportunity in digital agriculture to reduce costs and increase credibility of existing sustainability certification and verification programs operated by major customers (e.g. retailers) or NGOs (e.g. Marine Stewardship Council). This can lead to enhanced engagement and access to sustainability performance data for consumers and possibly greater uptake by food producers and businesses along the supply chain.

Overcoming Barriers to Further Adoption

Overcoming barriers to further adoption of digital agriculture initiatives across food production supply chains is necessary to fully realise the opportunities of engaging consumers on their sustainability concerns. Primary barriers are concerns from producers on ownership of any data shared, the privacy of data they collect and share, data storage integrity, and how the data will ultimately be used. Who shares data - and how - in any current or future commercial benefit from data sharing is also a key factor to be addressed. Producer concerns on these issues may be further heightened in the context of radical traceability.

Principles for appropriate data governance are emerging in the US, New Zealand and in Australia, which may help to allay concerns of various supply chain actors. The 'openness' of digital data platforms appears to be a crucial factor in the success or otherwise of digital agriculture initiatives, as does producers of data retaining ownership of all data they share. Collaboration across government, industry and NGO stakeholders also appears to be vital for success - and is highly relevant for credible engagement with consumers as it fuels trust and credibility.

Apps: Consumer-led Tech Approaches

Consumer-led technology applications providing information on various sustainability aspects of food are developing rapidly. There is a risk that these 'fork to farm' approaches, in absence of industry leadership and engagement, could define the consumer engagement opportunity, rather than 'farm to fork' approaches where producers are driving the sustainability performance information. For Australian producers and food businesses, there may be opportunities to partner with and engage 'fork to farm' platforms as part of their consumer engagement strategies.

Recommendations

Food businesses looking to explore and engage with the opportunity of digital agriculture for consumer engagement on sustainability of food production may be well served by exploring traceability projects. Such initiatives will start to engage consumers on what they currently find important, as well as begin to build business capacity and systems for digital engagement with their consumers and their supply chain (where relevant), including aligning internal stakeholders (e.g. marketing, quality, sustainability) and necessary external instruments (e.g. supplier contracts re ownership, use of information). Such projects will also test and experiment with 'what works' (i.e. there are likely quite a few iterations required to find the right mix of variables), and build a platform for future addition of 'traceability plus' information (e.g. sustainability performance data at farm level).

Adoption and implementation of emerging good practice principles for digital agriculture data governance (e.g. open, farmer-ownership, collaboration) is also recommended, with a commitment to ongoing review and learning. The establishment of an *Australian Digital Agriculture Forum*, as proposed by the Australian Farm Institute's April 2016 report, 'The Implications of Digital Agriculture and Big Data for Australian Agriculture', will greatly assist in driving continuous improvement and overcoming the data governance barriers to the growth of digital agriculture and the realisation of its potential to deliver more sustainable and transparent food production systems.