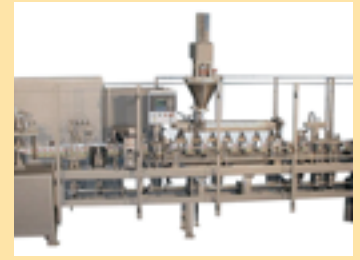


FMCG Fruit & Vegetable Processing Technology

RWA

Robert Weller & Associates
INNOVATION CONSULTANTS



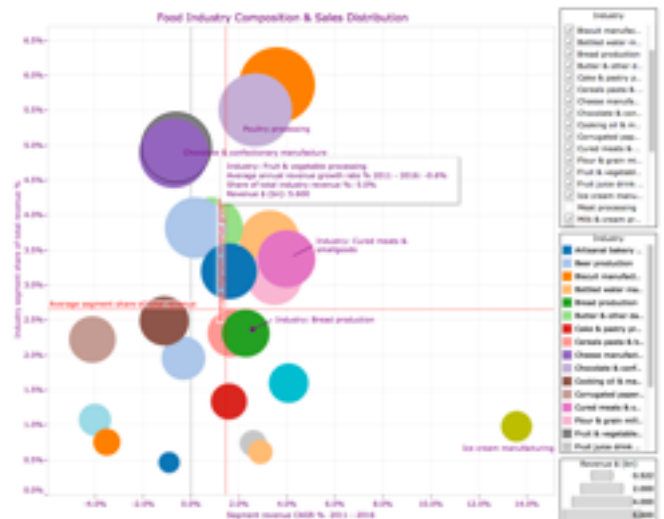
business technology grants and support apples innovation npd
fruit juice consumer led design future factory super-foods market
share segmentation export opportunities top-line growth new customers
foodservice analytics big data apples trends rob weller & associates pears
r&d tax investment opportunities pears cherries strawberries packaging

Fast Facts on the Australian Fruit and Vegetable processing industry.

IBISWorld reports that the fruit and vegetable processing sector in the 12 months to October 2015 generates \$5.6 bn in revenue. The sector generates profits of over \$300 million for more than 500 individual businesses.

Market watcher, *RetailWorld's* aggregated Australian retail market for all types of processed fruit at 31st December 2015 is worth almost \$220 million or just over 41,000 tonnes of product. Fruit juice and drinks are worth \$440 million with the largest market shares belonging to Heinz, Lion & Schweppes. If you're a user of Tableau®, get in touch and we'll share some of our interactive up-to-date market analytics and visual insights with you.

Thought about partnering with the government in order to bring your food ideas to life?



Government Grants & Assistance

A number of grant schemes are open and available for fruit and vegetable supply chain participants. These include;

1. Victorian State Government: Sector Growth Fund : Food & Fibre
www.business.vic.gov.au/_data/assets/pdf_file/0006/1272363/Sector-Growth-Program-Guidelines.pdf
2. Accelerating Commercialisation
<https://www.business.gov.au/assistance/internal-assistance/accelerating-commercialisation>
3. Regional Assistance Grants.
<https://www.rdv.vic.gov.au>

Give us a call to discuss your circumstances and ambitions and we'll do our best to find a funding solution that works for you.



Newsletter editor, Adam Perkins has a twenty year career in food processing. He has worked locally and internationally with several FMCG multinationals, including a lecturing role at one of

to talk about how best to support your business ambitions with sound, proven, commercial advice.

Adam Perkins : 0404 875 276

Rob Weller : 0408 352 494

Gary Issacs: 0407 521 969

Africa's largest agricultural colleges. In addition to his technical capabilities, Adam has a background in IP law, where he has worked in-house and as a consultant to a number of law firms, helping clients identify, manage and commercialise their ideas. Adam and the team at RWA are always available

Summarised Science

vegetables in general) form a



June : Focus on Fruit

RWA keeps in touch with the latest published science through proprietary subscriptions to some of the world's leading food science, engineering and agriculture journals.

Science that caught our eye during the month included;

- Technology to slow or stop discolouration in cut fruit.

- How to optimise the clarification of fruit juice using enzymes.

- A novel use for ingredient, glutathione is found.

- Researchers report that pretreating apple pieces with ultra-sonics prior to drying delivers a superior end product in terms of colour, taste and energy input costs.

- A couple of other papers, again on drying (apricots and fruit and

useful refresher for food engineers and technologists on best practice principles. (The dried fruit category in the Australian retail market is worth \$196 million and represents 17,200 tonnes of product according to the latest *RetailWorld* market figures)

- The extraction of citric acid and powered phenolic compounds (antioxidants) from fruit and vegetable juices is reported in a two papers. The ability to cost effectively extract and refine high value added "super-foods" and functional ingredients often found in peel, pomace and seeds will become increasingly important to the economics of fruit and vegetable processing.

Get in touch and we can provide you with a full copy of the paper, or a shortened abstract if you prefer.

1. *Influence of cultivar, solutions, packaging gasses, and advanced technology on browning in fresh-cut apples during storage.*

The paper contains a useful model for calculating discolouration rates; "Anti-browning Apple Calculator – C.A.P.P.A.B.L.E.©"

Journal of Food Process Engineering June 2016

2. *Preparation of canned apple juice using glutathione an an enzymatic and non-enzymatic browning inhibitor.*

Glutathione (0.08%) inhibited polyphenoloxidase activity by 99.8%. Browning decreased in apple juice treated with 0.08% glutathione during juicing, processing and storage.

Journal of Food Processing and Preservation 16th April 2016



3. Modeling the thin-layer drying of fruits and vegetables: A Review:

This paper is a nice primer for any food technologist or process engineer looking at drying technology for the first time, yet will still

appeal to more experienced scientists in need of a refresher. The mathematical models presented are not too difficult to appreciate. The historical treatment and evolution of process models is a bit tiresome. Readers should value the reasonably reliable equations and various conditions used in

the estimation of the effective moisture diffusivity, product shrinkage effects, and minimum energy requirements. "The authors hope that this review will be of use for future research in terms of modeling, analysis, design, and the optimization of the drying process of fruits and vegetables." Their objective is mostly accomplished.

Process engineers and factory managers involved in fruit drying would do well to read.

Comprehensive Reviews in Food Science and Food Safety, Volume 15, Number 3 1st May 2016, pp 599-618(20).

Private label (26.9%), Sunbeam® (23.9%) and Angas Park® (21.9%) have the largest market shares by value of the \$196.3 million dried fruit category

4. Ultrasound as a pretreatment



method to improve drying kinetics and sensory properties of dried apple.

Idared® apple pieces were subjected to a commercial ultrasound treatment of 35 kHz for 30 min. Conventional drying in a convection oven at 70°C. The sonication treatment reduced drying time by up to 17% in comparison with the untreated sample as well as producing material preferred in colour and sensory assessments.

Journal of Food Process Engineering. Volume 39, Issue 3, pages 256–265, June 2016.



6. Extraction of Citric Acid from Fruit Juices using Supported Liquid Membrane.

The paper presents an alternative technique for de-souring citrus fruit juices in order to improve palatability and consumer acceptance. As membrane filtration techniques become ever more sophisticated and widespread (think the dairy sector !; your editor believes this technology will become more widespread in the fruit juice industry.

4th June 2016 *Journal of Food Processing and Preservation*.

high total phenolic content



(TPC), high antioxidant activities, and preferable sensory properties using a mixture design.

More and more products are positioned as "superfoods" combining "non traditional" ingredients such as fruits and vegetables. The paper stands as a useful read on balancing up functional ingredient levels with palatability and taste concerns.

11 May 2016 *Journal of Food Processing and Preservation*.

5. Infrared Drying and Effective Moisture Diffusivity of Apricot Halves: Influence of Pretreatment and Infrared Power. June 2016 *Journal of Food Processing and Preservation*

7. Formulation optimization of antioxidant-rich juice powders based on experimental mixture design.

This study optimized the mixing ratio of broccoli (BroMP), cabbage (CabMP), and carrot-mixed powders (CarMP) for the development of juice powders containing

The future is here now : What will fruit and vegetable supply chains and processing facilities of tomorrow look like ?



RWA bets on five big trends that will shape investment in the sector.

1. Greenhouse technology.

Did you know that electronics giants, Fujitsu, Toshiba and Sharp are converting discarded factories that once made television screens and silicon chips into greenhouses and will soon become some of Japan's largest growers of lettuce, spinach and other vegetables.

2. Modern efficient post harvest handling systems.

Think robotics, imagine more efficient flume systems with better water recycling and re-use capabilities along with reduced produce damage. Take a look at what the Australian olive industry is doing as an example of setting and leading world's best practice.

3. Ingredient provenance & end to end traceability.

Track & trace down to the orchard and even tree level will become the norm. Supply chains will become even more efficient through their investment in the "internet of things". QR codes, barcodes, RFID tags and other "smart" systems will become a seamless source of information. Consumers are beginning to demand it.

4. Same same but different.

Traditional heat exchangers, homogenisers, pasteurisation tunnels and retorts will continue to dominate the process floor, but room will soon need to be found for specialist equipment that could include high pressure processing, sonication equipment or a supercritical fluid plant. Future food factories will begin to look more "pharma-like" in their layout, kit and quality systems.

5. Packaging innovation.

A number of packaging companies are developing haptics technology and tactile feedback innovations for labels and primary packaging. Imagine if your customers select a pack from a supermarket shelf that has the feel and texture of a firm ripe peach or open a packet that emits all the sensory cues of biting into a crisp apple.