



THE UNIVERSITY OF
SYDNEY

Industry and Communi Project

Future of Milk – Project Outline

Intensive Project – International
Exchange between University of Sydney
and University of Padova

Contacts

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About this Project Outline

This Project Outline contains information specific to your Industry and Community Project. It is part of the Unit of Study Outline. Policies relating to marking of assessments are in the Unit of Study Outline document.

Project Description

What is the future of milk? Milk and milk-based foods are a significant part of a many diets around the world and demand is set to increase, particularly in Asia, as the global population rises. Fresh milk is a daily purchase for many households in Australia and Italy and a reason for many supermarket visits. In addition, fresh milk and manufactured dairy products including milk powder, cheese and butter are major export commodities with enormous capacity for growth.

Globally, Australian dairy products can be differentiated on the basis of a strong reputation for 'clean and green' production systems. Italy has a significant export trade in dairy and is especially renowned for traditional cheeses such as Mozzarella, Grana Padano, Parmigiano Reggiano and many others which are listed as protected denomination by origin (PDO).

However, the farmgate price for milk is low and exposed to volatility of the global market, while production costs continue to rise. This drives dairy farmers to push productivity and improve efficiency to maintain incomes.

At the same time, the dairy industry is coming under increasing scrutiny. Animal advocates are questioning the ethics of the treatment of animals and there are environmental concerns of contamination and excessive water use. In addition, the nutritional benefits of milk are often questioned, in some cases these are evidence-based concerns around allergy and intolerance and in other cases, the claims are much less substantiated. As a result, many people are switching to alternative 'milks' such as soy and almond milk for health and ethical reasons. Synthetic milk, produced in factories without the need for animals or crops, is fast becoming a commercial reality and has potential to be a major disruptor of the dairy industry. In addition, there are concerns that with the increase in global trade, boutique products such as specialty cheeses, may be more exposed to food fraud.

This project is a unique opportunity for cultural exchange between students from the Universities of Sydney and Padova and to explore these issues from multiple and non-traditional disciplinary perspectives. It is expected that a collaborative, interdisciplinary and intercultural approach may reveal novel and innovative opportunities for the dairy industry to add value, improve efficiency, address environmental and animal welfare concerns or take advantage of growing trends in food innovation such as 'smart food'. Smart food or food designed for health and wellness is the fastest growing food and beverage category resulting from a sharp rise in non-communicable chronic diseases.

Dairy in the 21st Century – Opportunities through big data analytics

'State of the art' dairying is a high-tech industry. For example, every cow is electronically identified and their food, milk production and health are monitored, digitally recorded and analysed. A high producing dairy cow makes up to 40 L of milk per day, using robotic milking machines in some cases. She must be supplied with suitable nutrition which may come from highly productive pastures, specially formulated rations or a mixture of both. Through careful herd recording, the best cows and bulls are selected and reproductive technologies such as artificial insemination and embryo transplantation are used.

This generates data on farm at high frequency and at a fine scale. There is great potential to use those data to help drive efficiency. The NSW dairy strategic action plan identified a lack of measuring, planning skills and goal setting on-farm. To assist the industry, NSW Department of Primary Industries is working closely with CSIRO to better improve the way data is being managed to support decision making on farm and throughout the value chain. The objective is improved dairy

profitability by optimising feed conversion to milk. This involves the development of platform tools to aggregate, analyse and display data gathered on-farm, as well as providing benchmark and predictive capabilities.

Milk processors transform raw milk to make it safe and to produce many different products such as skim, lite and lactose free to satisfy different consumer groups. A2 milk has become a successful market segment based on claims of improved health outcomes. Some farmers are innovating their business model by integrating milk production with processing, making the most of small scale, local farmer attributes and capitalising on a growing interest in provenance and authenticity of food. Milk is manufactured into several different products (eg. cheese, butter, ice cream) all with unique organoleptic properties related to origin, production and processing systems. Digital technologies are increasingly being exploited to connect next users and consumers with data so they can make informed decisions about purchases based on defined values around quality, provenance, ethics etc.

Students will be exposed to the Australian dairy production system through visits to farms, milk processors and manufacturers. Access to industry information including reports and datasets collected from digital dairy farms in Australia will be provided by the Project Partners. Students will also have full access to online resources through the University library.

Project scope

1. Students will be placed in diverse, interdisciplinary groups and immersed in the Australian dairy industry through guest lectures, site visits and reading materials.
2. Students will attend training workshops on personal and professional reflection, collaboration and complex problem solving.
3. Each group will define a problem or opportunity to explore through a facilitated and iterative process of ideas filtering.
4. A problem statement, desired outcomes and a systems map of the issues will be presented at the end of week 1 both orally and in written form.
5. Ideas will be researched, tested and refined by consulting literature, analysing data, conducting surveys and interviews.
6. Final outcomes and recommendations will be delivered in an oral presentation and written final report.

Project partner

The project is sponsored by the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) Data61 in partnership with NSW Department of Primary Industries.

Mr Peter Carter is an agricultural economist and digital innovation advocate at CSIRO's Data61 business unit. He has a farming systems background and is leading supply chain integrity and food provenance program activity involving industry partners and multidisciplinary teams across CSIRO. This involves on-farm and remote sensing, IoT and automation with computational systems teams developing big data analytics, machine learning and AI systems and tools. Peter is focused on smart and trustworthy agricultural supply chains, traceability and developing platforms that enable de-commoditisation and serialisation of everything. Moreover a future where trade and commerce is increasingly digital – driven by platform services, smart contracts and the automation of regulation and laws.

Dr Nico Lyons is a development officer at NSW Department of Primary Industries. His research interests are adoption of technologies and optimisation of data that will push current boundaries, with a strong focus on research, efficiency, profitability and sustainability. Nico has over 10 years of international professional experience working directly with farmers and in very close relationship with researchers, farm consultants, milk processors and service providers, both in private and public organisations. His main responsibilities have always been to understand and analyse current on-farm and industry situations, conduct research in an effective and appropriate manner; but primarily developing, delivering and monitoring effective ways of transferring that body of knowledge to the wider industry.

Both Peter and Nico have engaged with the University of Sydney on the local, semester-long version of this project for two semesters mentoring nine interdisciplinary groups of students. Previous student groups have identified and explored the application of blockchain technology to traceability in dairy as well as facilitating access to non-traditional sources of farm finance, innovative business models including a framework for evaluating fairness in the value chain, value-added products and technologies such as capitalising on the health benefits of bovine colostrum and cold pressed milk processing applications, and opportunities and threats posed by dairy alternatives such as synthetic milk.

Project Schedule

Future of Milk – Project Schedule 5 Feb – 1 Mar 2019

Date	Time	Activities	Assessment/tasks
Week 1			
Tuesday 5 Feb	10 – 1	<ul style="list-style-type: none"> • Welcome to Country • Welcome University of Sydney • Introductions and orientation to the unit, objectives, assessment, group work etc. • Overview of project • Cultural competence presentation – Amanda Irwin • Global mobility presentation • University Library session – database searches • Overview of Canvas, reading resources 	Complete survey
	2 – 5	<ul style="list-style-type: none"> • Meet the partner – Mr Peter Carter Data61 • Dairy in the press – issues in dairy exercise • Students to fill in survey 	
Wednesday 6 Feb	10 – 1	<ul style="list-style-type: none"> • Navigate complexity workshop 	
	2 – 5	<ul style="list-style-type: none"> • Presentation – Dairy Industry – Board room perspective – Dr Dedee Woodside • Collaboration workshop – ideas filtering 	
Thursday	8 – 12	<ul style="list-style-type: none"> • Bus to depart city campus at 8.00 am • Field visit to Corstorphine dairy farm 	

7 Feb	1 - 6	<p>at Cobbitty - meet Dr Nico Lyons NSW DPI</p> <ul style="list-style-type: none"> • Presentation - Overview of dairy research (Prof Yani Garcia) • Lunch will be provided at Cobbitty • Field visit to Leppington Dairy • Bus to arrive back at city campus by 6.00 pm 	
Friday 8 Feb	10 - 1 2 - 4	<ul style="list-style-type: none"> • Presentation - Dairy supply chains - Dr Ash Salardini, Chief Economist, NSW Farmers • Presentation - Writing SMART objectives • Identification of problem statement and desired outcomes • Systems mapping to identify key variables 	

Week 2			
Monday 11 Feb	10 – 1	<ul style="list-style-type: none"> • Reflection and review of problem statement and desired outcomes • Writing aims and approach – brief presentations on research methodologies 	Group Plan presented Tuesday morning
	2 – 4	<ul style="list-style-type: none"> • Work on group plan 	
Tuesday 12 Feb	10 – 1	<ul style="list-style-type: none"> • Presentation of group plan (5 min per group) – Partners and DW present 	Submit group plan (2 pages) Tuesday 11.59pm
	2 – 4	<ul style="list-style-type: none"> • Work on Group plan – incorporate feedback • Finalise group plan for submission 	
Wednesday 13 Feb	10 – 1	<ul style="list-style-type: none"> • Presentation – Research methods • Students to refine research question and approach 	
	2 – 4	<ul style="list-style-type: none"> • Data collection 	
Thursday 14 Feb	10 – 1	<ul style="list-style-type: none"> • Presentation – Stakeholder analysis and collecting qualitative data 	
	2 – 4	<ul style="list-style-type: none"> • Students to identify key stakeholders and conduct stakeholder analysis 	
Friday 15 Feb	10 – 1	<ul style="list-style-type: none"> • Presentation – Presenting for impact • Students continue to collect data • Identify questions to ask stakeholders 	Individual statement (part 1)
	2 – 4	<ul style="list-style-type: none"> • Prepare draft pitch for shark tank 	
Week 3			
Monday 18 Feb	10 – 12	<ul style="list-style-type: none"> • Students work on shark tank pitch 	
	1 – 4	<ul style="list-style-type: none"> • Shark tank (Industry partner and guests) • Stakeholder interviews 	
Tuesday 19 Feb	10 – 1	<ul style="list-style-type: none"> • Presentation – Analyzing and presenting data • Continue to collect and analyse data 	

	2 – 4	<ul style="list-style-type: none"> • Continue to collect and analyse data 	
Wednesday 20 Feb	10 – 1 2 – 4	<ul style="list-style-type: none"> • Presentation – Writing reports with multiple collaborators • Continue to collect and analyse data • Continue to collect and analyse data 	
Thursday 21 Feb	10 – 1 2 – 4	<ul style="list-style-type: none"> • Analyse data and prepare presentation and report draft • Analyse data and prepare presentation and report draft 	
Friday 22 Feb	10 – 12.30 12.30 – 2	<ul style="list-style-type: none"> • Group presentations • BBQ lunch 	
Week 4			
4 25 th Feb – 1 st Mar	Students back on home campus	<ul style="list-style-type: none"> • Students will work remotely writing-up the group and individual assessment tasks 	Individual Statement (part 2 – due Monday 25 th Feb) /Group Project Report (Due Friday 1 st March)

Assessments

Insert assessment descriptions and rubrics. You may use the model assessments, descriptions and rubrics in the ICPU Handbook.

Assessment	Type	Weighting	GQ/LO	Assessor	Due
Group Plan 2500 words	Group	20%	1, 2, 4,	Project Supervisor	Week 1 (Friday 11.59pm)
Group Presentation 20 min	Group	10%	2, 4,	Project Supervisor	Week 3 (Friday in class)

Individual Statement 1500 words	Individual	20%	1, 3, 4, 5	Project Supervisor	Week 4 (Friday 11.59pm)
Group Project Report 5000 words (or equivalent) This assessment includes an individual contribution mark worth 10/50 marks.*	Group	50%	1, 2, 4, 6	Project Supervisor	Week 4 (11.59pm Sunday)

***Individual contribution to group work mark**

The Group Project Report is worth 50 marks. Ten of the 50 marks is an individual mark awarded for a students' individual contribution to the group's work, culminating in the Report. Individual contribution is assessed by the Project Supervisor. Ordinarily it is assumed that all members of a group contribute equally to group work, and that the same overall grade and mark out of 50, should be received for the Group Project Report, by each group member. In the ordinary case then, the grade given for the individual contribution mark would be the same as the grade given for the group report mark. So if the grade for the group report was to be a DI (80% = 40/50 = 32/40 = 8/10), all students would receive 40/50 (32+8) (DI).

In some cases however, there may be evidence that a member of a group has significantly under-contributed to groupwork, or has substantially contributed to the work contributed on behalf of group, where other members have failed to adequately contribute. In those cases the student may merit a higher or lower mark out of 50 than other group members. In these cases, the individual contribution mark out of 10, can be used to make this adjustment.

The students' contribution is assessed by the Project Supervisor.

Policies

Policies and procedures in relation to special consideration, simple extensions, Academic dishonesty and plagiarism, Use of Similarity Detection Software, Submission of Assessments, Attendance and academic appeals are set out in the Unit of Study Outline.