



THE **STORIES**

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FAIRFAX SYNDICATION



Pia Winberg

Venus Shell Systems,
A Marine Biomass Farm

Ask most people what they think of seaweed, and they are likely to mention sushi. But one Australian woman has spent the past decade trying to expand perceptions of this aquatic plant, which she believes is one of the stars of sustainable food sources for the future.

Dr Pia Winberg, who graduated from the University of Wollongong (UOW) with a Doctorate in Marine Conservation Ecology in 2008, believes Australia's extensive coastline and good, clean waters make commercial production of seaweed in Australia not only viable but a highly profitable and socially ethical venture, particularly as the world searches for strategies to tackle increasing food demands and decreasing supplies of wild (ocean) fish. According to Dr Winberg:

“Cultivation of seaweed in the Asian countries is huge, with a global crop worth over AUD\$6 billion – and that’s just the crop itself. But Australia and the West are hardly cultivating it at all. Europe is starting to show some interest, and France in particular is developing in the area, but Australia has done very little.”

That \$6 billion crop equates to about 8 million tonnes of wet seaweed each year. Wild harvesting (predominantly from the Atlantic Ocean) accounts for only 5 per cent of this. Demand far exceeds the rate at which wild beds can regrow, hence 95 per cent of the total crop is grown and harvested in established ‘farms’ found mainly in China, Korea, Japan and the Philippines.

Despite seaweed not being part of a ‘traditional’ Australian diet, Australia imports about \$17 million worth annually, and over recent years demand has been steadily increasing by an impressive 30 per cent each year. Whilst its place in Asian cuisine is well known, what is less known is how widely it is used in other areas, such as improving soil quality and plant health in agriculture, as a cleansing/purifying agent in soaps, toothpastes and skin products, and for its amazing health and medicinal benefits including anti-cancer, anti-oxidant, anti-inflammatory and anti-viral capacities. In fact, with its high levels of omega-3 fatty acids, calcium, minerals and iodine, along with the ease with which it is grown and harvested, it is fast gaining a reputation as one of nature’s super foods.

So confident was Winberg in the potential of this superfood that in 2014, with the help of motivated investors, she made the bold decision to move away from full-time academia to establish a pilot seaweed production facility, Venus Shell Systems, near Nowra. The first of its kind in the country, the project has since proven itself to be scalable, technically viable and capable of producing good yields. Although there are still hurdles to overcome in terms of accessing markets, it seems Venus Shell Systems is on track to become a player in the global seaweed production industry.

However, getting the support of government, community and business for her ideas hasn't been easy and, according to this 'scientist come entrepreneur', one of the most powerful tools she has utilised has been conferences: to gather information, make important contacts, and get her messages heard by those who needed to listen.

"The conferences I've attended over the last 10 years have actually been very, very, important in terms of me garnering confidence, developing a broad base of knowledge, and helping me to interact with relevant people in my field. And that's helped me to now become internationally recognised as someone with expertise in this field of research."

Early in her academic career, Winberg recognised that for science to be truly valued it needed to be made relevant to the wider community, and for her that meant finding ways to translate what was learned in the lab into practical outcomes that could make a difference to people's lives.

"Scientists just tend to publish in peer reviewed journals and it's very hard to get the ideas communicated well through mainstream media because we're scientists, and that's not the traditional way it's done. I always felt the missing link was finding ways to make [scientific] conversations really relevant to human society. I wanted to know what other people were thinking, and I found that going to a range of different conferences was a really important means of broadening my perspectives on what was important to people; what they were doing, where they're headed, and what the community's overall trajectory was."

After attending her first conference in 2005, Winberg was approached by the Rural Industries Research and Development Corporation (AgriFutures

Australia), which funded a study to identify ways in which her research could be applied commercially for new seaweed crops in Australia. Soon after, they funded her attendance at the 2008 International Society for Applied Phycology conference in Ireland to enable her to gain knowledge about what was happening in the field internationally and to learn about how such industries could be established and developed in Australia.

“As part of that funding I was to bring back a detailed report for general publication, so I sat there and absorbed all I could about what was clearly a very broad and diverse field. Everything from biofuel production to food growing to harvesting and all sorts of different aspects I otherwise wouldn’t have ever even thought to spend time reading about.”

After graduating in 2008, she stayed on at UOW and, alongside her teaching and supervisory roles, established the university’s Shoalhaven Marine and Freshwater Centre (SMFC). As Director of the centre, she and her students began researching ways marine ecosystems could be enhanced by the introduction of seaweed, as well as investigating sustainable marine food production systems. In particular, they became interested in ways that seaweed could be commercially and mass produced for large-scale human and animal consumption through the practice of aquaculture. Sensing this was a potential growth area of the future, she threw herself into learning all she could about the industry, and insists that going to conferences was the most useful element in that process, both for herself and for her students.

“You understand a lot more from a conference than you do from sitting, reading very specific information in peer reviewed literature, so I spent a lot of time going to conferences and interacting and networking with economists, investors and business people outside my field of research.

“I also made sure my students attended as many conferences as possible because they’re very good training for them; scary – but really important. As a research student you always feel overwhelmed in your first few conferences because you don’t understand the hierarchical structure inside academia but they’re always so valuable. I think even undergraduates should be really strongly encouraged and supported to go to conferences in those early years of their education so they learn how information

is disseminated and then they learn more quickly how to contribute constructively and confidently to the conversations as their careers develop.”

After the 2008 conference she went to as many others as she could, always learning but also presenting her own material, and then in 2014, with the help of Rural Industries and some very supportive Sydney-based businesses, she coordinated her own International Psychology conference in Australia.

That conference was highly successful, particularly in terms of Winberg’s philosophy of making science relevant to the wider community.

“We really wanted to make this conference relevant to the public in some way. We wanted to have all the important delegates and information there but we also wanted to communicate things in a fun way because the public [aren’t] going to sit there and listen to boring professor presentations.”

So, as part of that focus, and with Australia’s growing reputation for diverse cuisine and food innovation, they decided to put together a recipe book based on seaweed.

“We brought 27 seaweeds from around the world – from researchers in industry that were actually delegates at the conference, and gave those seaweeds to 18 local food chefs, and said, ‘Cook anything but sushi!’

“We thought this was a great way to not only showcase Australia’s culinary expertise to the international delegates, but also to make the international delegates more relevant to the locals. We launched the book, Coastal Chef, right there at the conference, and so automatically those scientists coming from as far away as Portugal or northern Canada had already collaborated and were now partners in a book production with local chefs when they arrived at the door.

“At the opening event we had attendees from the public – just mainstream people interested in food – as well as the chefs and the delegates, and the dishes were served to everyone. We generated a lot of media and public interest, and everyone had a lot of fun, so I think that was an important strategy.”

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The conference also included an open public debate with well-known media personality and comedian, Adam Spencer, as MC to draw in a crowd beyond academics and to put the controversial topic of algae and biofuels on the table.

“I believe the public has an interest in understanding more about this whole area of sustainability and biofuels etc. so we put together a panel of six scientific experts as well as local energy and sustainability professionals and had a debate with a poll going in and out from the public’s perception.

“It was really useful and a bit of reality check to find out what the public thinks and what they think the challenges are because scientists can get so caught up in tiny details of research that they sometimes just forget the relevance of the big picture.”

Winberg saw this element of the conference as being very powerful because of how it managed to influence how people felt about future prospects for algae and solutions to sustainable biofuels.

“It was very important. When we did the polling we realised we had actually shifted the audience’s perceptions of algae for biofuels before and after the event, which was great.”

But Winberg does admit the time and effort spent coordinating the event was significant.

“It’s a lot of hard work and personal risk. So much time is spent in organising all the details, and whilst conferences are clearly recognised as being important, you’re not very well supported or well rewarded inside universities when you make the effort to host one. That’s why, sadly, there are a lot of academics who never make that effort.

“It’s a shame, really, because the whole experience was very positive and very rewarding, and although I’m outside the university arena now, I still feel so much more could be achieved if academics were encouraged, supported and rewarded for hosting more conferences in their fields.”

What she found most valuable at many of the conferences she attended throughout the years was the opportunity to consider a wide range of relevant perspectives.

“You really can’t grasp the emotional aspects of an issue from reading black and white scientific articles because the culture of communication is very restricted; very factual.”

“At many of these conferences it was exactly the opposite – and there were some very heated, controversial questions and debates. I hadn’t been aware of many of these controversies or the level of antagonism there was across some sectors, so it gave me an insight into differences of opinion and what those opinions were based upon. Over time it also gave me the confidence to participate at that level and put ideas forward because unless you’re exposed to those opinions and those debates in a conference forum you can’t understand the whole picture.”

Another conference strategy Winberg adopted was to cross-pollinate her ideas across a range of conference types. Rather than just attending seaweed or aquaculture events which gave her the latest information in her own field, she also targeted events that were only marginally relevant (such as the psychology, nutrition and aquaculture conferences and Biomarine Business Convention), using each opportunity to learn, but also to get her message out.

“It’s so important to go out of your own area of research and step out of your comfort zone.”

“Sometimes, you go to those algae conferences, and you’re just saying, ‘Well, my algae is better than your algae’ and it doesn’t actually take you anywhere whereas, if you go to, say, a nutrition conference, and you say, for example, ‘Well, how about putting seaweed into one of your clinical trial projects and seeing how seaweeds can contribute to very important chronic diseases or malnutrition?’ you can really take your area of expertise and jump into another area of research and put it into relevance for that area.”

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“That’s where innovation happens; with a cross-fertilization of ideas.

“It’s very hard to start publishing in a totally new field of research that you don’t have a track record of publishing in or have much knowledge in, but you can go to a conference and present what you know and interact with people who have other areas of expertise and create new projects.”

Winberg says that, even though you may be relegated to a small, short session, or there may only be a few attendees in your session, you can still have a big impact on people’s thinking.

“When you bring your ideas to a range of conferences you can have that information disseminated and discussed and tweaked and refined before you’ve actually, you know, finished and delivered your findings on a \$200,000 research grant, for example.

“You can bring your ideas ‘to the table’, in a sense, and many of the research projects and collaborations I’ve received funding for have been based on meeting people this way at different types of conferences.”

One such important collaboration was with nutritionist Professor Barbara Meyer. Despite the fact that both researchers were based at the University of Wollongong, they had never met, and only after speaking at a conference did they realise the potential there was to work together.

“I went to a conference on seafood and health, and while I was there I met a nutritionist from my own university who started talking to me about an interesting study on reducing aggression that had been done in a UK prison by feeding inmates omega-3s.

“I told her about a new prison in our region, and talked about my seaweed research and we thought we’d try to replicate that study here in an Australian prison, and so we did, and our findings were later published in a very high-level peer review journal.

“The project was also featured on Catalyst last year on the ABC, and now we’re continuing to collaborate on a range of health and nutrition projects and have a whole host of undergraduate students taking our knowledge on seaweeds and seaweed biomass and putting it into clinical trials.”

With researchers and students from other health-related areas becoming excited about the projects and joining the team, they are now in the process of establishing a formalised program of research and, according to Winberg, the whole thing was triggered as a direct result of conferences.

She said conferences have been integral in enabling her to engage other researchers, industry, government regulators and the community in the questions and issues she saw as being important. Those that specifically bring in business and researchers from industry, establishing a combined focus on innovation, progress and funding, realise some of the best outcomes. This is because they set up very specific partnering schedules and programs during the conference.

“There are some big silos in government research areas versus the regulatory areas and they don’t cross-seminate ideas easily, so I spent [a] lot of time linking and talking to people in all of those sectors to get a broader perspective on top of things I simply read about.”

One perspective that was shaped through interaction at conferences was the way in which science, and specifically some of the conservation initiatives being proposed or implemented, could potentially impact local people.

“In regional communities where things like fishing are very important you need to understand that sure, you can stop fishing to protect the fish – but then you end up with high unemployment. Then, high unemployment leads to other negative social issues so you have to look at the transition of industries and how to address the broader economic and social impacts of conservation; how do you make the two work together?”

Frustrated by policy-makers’ reluctance to make important changes or even acknowledge the validity of research findings of climate scientists, Winberg admits she has walked a courageous path somewhere between private enterprise and academia for most of her career, having always as a priority the enhancement of marine eco-systems in ways that were not only sustainable but also able to improve our way of life.

As a result of these experiences, Winberg has no hesitation rating conferences a clear “ten out of ten” in terms of their importance to knowledge diffusion

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in her field, and says their role in helping her attract funding throughout her career was crucial.

“They really are just so important on so many levels, particularly as part of a long-term strategy for getting public funding. At the conferences you become aware of what sources there are and they become aware of you.”

“I realised early on that the FRDC (Fisheries Research and Development Corporation) was a major government funding body for aquaculture research but I don’t think they’d taken seaweed seriously as a contender for future aquaculture or research and development projects until they kept hearing me speaking about it at conferences. You just have to keep flying the flag for your area of research and why it’s relevant and slowly but surely with a track record of persistence, you can demonstrate why your area warrants more investment.”

The strategy seems to be working for Winberg, who last year was one of only 10 people invited by the FRDC to attend an important funding and strategies meeting about the future of aquaculture in Australia.

“That’s happened purely because of attending conferences and introducing my ideas to these people.”

Winberg also stressed how important conferences were for making international contacts that often translate into working collaborations.

“Through conferences, I have an international network of professional friends, and we catch up at other conferences or when we’re visiting each other’s country. We know that even if there’s not an immediate opportunity for close collaboration, we keep a friendship sort of relationship going because we know that probably in a year or two there’s going to be a real time and place to work together. They’re like sitting in your head and you might suddenly go, ‘Ah, this person can... (whatever they do)’; so then you just call on them very easily, because you’ve got that very good relationship with them already.”

Still an Honorary Fellow at UOW with very strong ties with academia, Winberg said she simply realised she wasn’t going to achieve the outcomes she wanted to by following a purely academic career path, and when

funding was secured to support her passion for the creation of a viable seaweed aquaculture venture in Australia, she knew she had to make the transition.

“It’s an ideal situation now because I can operate, if you like, as an academic when I need to but also have the freedom and independence to put ideas into action through the Venus Shell Systems project.”

Once again, Winberg credits conferences for helping her attract that funding, as well as funding for other projects she’s been involved in along the way. She says there are strategic ways to approach conferences to make sure you are getting the outcomes you need.

“Personally I find it very difficult within the scientific field of research to garner interest in private funding, so I also attend other types of conferences, like the annual Biomarine Business Convention, which I’ve gone to for the past three years.”

“They specifically bring in business interests and researchers from industry – rather than researchers from academia – because it’s a conference event that really tries to focus on innovation and progress and private funding partnerships and outcomes.”

She says that at Biomarine, outcomes are measured in terms of the number of deals or the dollar value of deals that were established at the conference and they set up very specific partnering schedules and programs during the conference.

“So I wanted to go and listen to some roundtable discussions on a particular area of interest, rather than just listen to research presentations from the keynote speakers, because they seem to have experts at these round table discussions.”

“Parallel to that, they have one-to-one business meetings which you book online before you get to the conference. And then you have a schedule and a timetable of sitting down, like speed dating, I guess, and you target whether you want to talk to a company that might be interested in testing your product for a new medical application. Or you can sit down and

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talk to investors or venture capitalists, so these types of conferences are also incredibly important too.”

Winberg believes that, by regularly presenting your ideas at conferences, a range of investors come to understand the potential in what you are doing and you gain credibility.

“There can be a lot of hype in new industries, and it’s very hard to tell the difference between people who know what they’re talking about and those that don’t and I think because you’re recognized in the literature but also in attendance and speaking at conferences that investors – they actually feel more confident that, ah, this person is for real.”

This became evident 12 months after the 2008 conference in Ireland, when she learned that conference organiser Stefan Kraan had been funded to put his own concepts into production.

“He got private funding after that conference and started a commercial company formulating seaweed ingredients for animal health.

“He now runs a very successful international company, Ocean Harvest, that improves feed for farmed salmon, thereby increasing the nutritional value passed on to humans. I never made a conscious decision to go down that same path, but I can certainly see similarities emerging now.”

Professional friendships have been another important outcome from attending conferences. People she has met at conferences will visit her when they travel to Australia or she will arrange to catch up with them at a future conference. This is often on the basis that, even if there’s not an immediate opportunity for some close collaboration, they will keep a professional friendship going because they feel that in a year or two there is going to be a real time and a place for working together. “You can just call on them very easily, because you’ve got that very good relationship with them.”

With 800 million people worldwide suffering from chronic malnourishment, 3 million children under five dying each year from poor nutrition, and an anticipated global population of 9.6 billion by 2050,

many feel one of our greatest challenges of the future will be finding ways to feed ourselves without compromising the environment and its resources.

And while it's still too early to tell what long-term outcomes or legacies there will be for the Shoalhaven region, Australia and the rest of the world, there are signs that Winberg's passion and determination, along with her strategic use of conferences to blend the world of science, industry, commerce, society and academia in order to achieve her vision, will be a significant, sustainable contribution as that future draws near.