



Megazyme

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"You are what you eat"... and drink

Megazyme International Ireland Limited, winner of this year's Bray Endeavour Award for Large Business, develops test kits and reagents for quality control in the food, feed, fermentation, wine and dairy industries.

The company was founded in Sydney, Australia in 1988 and relocated to Bray in 1996. It has 26 employees, 10 of whom were employed over the past two years. Heavy investment in research and development in the "good years" has positioned the company to grow rapidly, even in these challenging times.

So what does Megazyme actually do? I asked this question of the CEO and owner of Megazyme, Professor Barry McCleary.

"Today's consumer demands food that is safe, high quality and consistent. While Megazyme is not yet involved in testing for safety related components, such as allergens, aflatoxins, microbial or chemical contamination, it is heavily involved in aspects of the food or beverage that relates to quality and consistency. It develops test procedures for the measurement of major food constituents, such as dietary fibre, starches, sugars, organic acids, nitrogen compounds and enzymes. In fact, each day, most people in Ireland, in fact in the Western world, will have consumed a food or beverage that has been analysed with a Megazyme test kit. Megazyme leads the world in dietary fibre test technology, with a new method recently validated internationally. If you check the ingredient panel on your breakfast cereal, loaf of bread, can of beans, then the stated dietary fibre level was most probably measured with the Megazyme Total Dietary Fibre test kit. Kellogg Co., Quaker Oats and H. J. Heinz Co. Ltd. are just three of the 10,000 or more Megazyme customers worldwide."

"For most humans, starch represents approximately 70% of the consumed energy. Starch content is usually measured with the Total Starch test kit that was developed by Megazyme and has been internationally accepted after validation through the Association of Official Analytical Chemists, International. We all know that oats are good for us. The reason for this is that they contain a high level of soluble dietary fibre. This particular dietary fibre is

known as beta-glucan. Megazyme developed a procedure to measure this component in the 80's, and even today, it is still the world standard method. In oats, beta-glucan is a valuable dietary fibre component. However, high levels of beta-glucan in barley and malt lead to filtration problems with wort (malt extract) and beer, and thus are undesirable. During the malting process (controlled germination of barley), enzymes accumulate in the germinating grain and these are essential for the conversion of the starch in the grain into fermentable sugars. Starch is degraded by the combined action of three enzymes, alpha-amylase, beta-amylase and limit-dextrinase. Megazyme has developed tests for each of these enzymes, and these tests are used internationally in the malting and brewing industry."

"Megazyme test kits are used to monitor bread and milk quality. In fact, the Megazyme procedure for lactose (milk sugar) is patented internationally and has been adopted by the United States Department of Agriculture. It is used widely to analyse for the absence of lactose in "lactose-free" milk products (to confirm that they actually are lactose free). Other tests monitor the quality of UHT milk."

"In 2003, Megazyme extended its research facility to house a molecular biology division. The aim was to develop capabilities to clone genes to produce enzymes that could be used in the development of test kits for the wine and food industries. This venture has been very successful, allowing Megazyme to compete with multinational companies involved in this field. In wine production, there are two fermentation processes; the conversion of sugars to alcohol, and the conversion of malic acid to lactic acid. These processes need to be closely monitored and this can be achieved with the relevant Megazyme test kits. In fact, there are over 20 different components in wine that affect quality and Megazyme has developed test kits for each; these components include malic, lactic, cit-

ric and acetic acids (related to spoilage), the sugars, glucose, fructose and sucrose and a number of nitrogen compounds and sulphite. We did not simply copy competitor products, we utilised modern technology including our molecular biology capabilities to develop improved procedures and products. In the four years since the kits were developed, Megazyme has become the market leader in Australia, New Zealand and Chile. Much of the wine you drink was analysed and standardised with a test kit developed and supplied from Bray. Penetration of markets in other countries is progressing rapidly, with increasing sales in USA, France, Spain, Italy and South Africa."

So what else does Megazyme do? "We also develop test technology for measurement of enzyme activities. Enzymes are biological catalysts; in our body they digest our food and they are widely used in food processing. Enzymes are produced industrially by major corporations in Europe, USA and Asia. These companies turn to Megazyme for their analytical requirements. The amylase and protease enzymes in biological washing powders are measured with Megazyme products, as also are the cellulase enzymes used to make "stone washed" jeans. In fact, stone washed jeans are no longer produced by rolling the jeans in tumble washers with stones, but rather are made by soaking the jeans with enzymes called cellulases, that attack the cotton fibers (cellulose) in the jeans. Controlled incubation with the enzymes gives the desired "stone washed" appearance. Megazyme test tablets are used to monitor cellulase levels in the major jeans processing plants worldwide. Enzymes are also used to increase the digestibility of poultry and pig feeds, and Megazyme products are used to monitor levels of these enzymes."

Where to from here? "Megazyme is now investing in research in fungal genomics with the aim of producing enzymes that will contribute to developments in biofuels and glycoprotein research. The challenges and opportunities are limitless."



Pictured are Ida Lazewska (Analytical Lab Manager), Paraic McGeough (Research Assistant/Biochemical Analyst), Anna Draga (Senior Analyst/Research Assistant) and Aoife O'Dwyer (R&D Intern) working in the Analytical Lab of Megazyme.



Pictured is Clifford Sullivan presenting Professor Barry McCleary of Megazyme with the 2010 Endeavour Award for Best Large Business.



Pictured is Patricia Feldwick (Receptionist) and Kerrie McCleary (Marketing Manager).



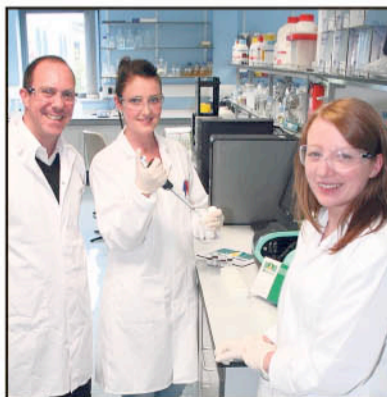
Pictured is Niall McCormack (Senior Production Technologist), Paul Brohan (Production Technologist), Edd Rooney (Biochemist) and Stuart Daly (Production Technologist) working with a Fermentor.



Pictured is Tom McWalter (Financial Controller), Gary Power, (Operations Manager), Shirley Delaney (HR/Office Manager) and Eileen Murphy, PA to CEO.



Pictured is Helena Culleton (Biochemist/Molecular Biologist), Jennifer Larkin (Biochemist/Molecular Biologist) and Ailbhe Ni Fhlaighartaigh (R&D Intern) working in the Fungal Lab.



Pictured is Dr. Vincent McKie (Head of Molecular Biology), Orlaith Dowling (Biochemist/Molecular Biologist) and Naomi Sloane (Biochemist/Molecular Biologist) working in the Molecular Biology Lab.



Pictured above are Sinead Byrne (Customer Services Manager), Maciej Peplinski (Stock Assistant) and Kim Clancy (Office Assistant) packing kits for distribution.



Pictured is Dr. Clive Mills (Senior R&D Scientist), Denise O'Brien (Technical Assistant) and Geraldine Boyle (Technical Assistant) in the Freeze drying room.