

Precaution or Prejudice

The potential for risk is present in everything,
but there can be risk in doing nothing.

Story & photos by **Troy Smith**, field editor

Mark Walton is tired of being maligned. He's weary of being told that he is uninformed. He's really peeved about repeated insinuations that "profit" is a dirty word.

Walton is frustrated by people who seem to want a production-agriculture model resembling that of a century ago.

The sources of Walton's aggravation are the activists who oppose modern agricultural technologies and seek their regulation through the "Precautionary Principle." It's a philosophy increasingly applied to the making of government policy in numerous countries. According to Walton, the Precautionary Principle pushes the adage "better safe than sorry" to the extreme.

"We must fight against prejudice that masquerades as precaution," said Walton, during the National Institute for Animal Agriculture's (NIAA's) annual conference April 1-2 in Omaha, Neb. "Innovation is stifled when public perception and government regulation [are] driven by the Precautionary Principle."

Walton is a geneticist with more than 30 years of experience in the development and marketing of agricultural biotechnology. He is associated with Recombinetics, a Minnesota-based firm that applies genome-engineering strategies to develop animals for the food and biomedical industries. Among those strategies is gene editing — modifying a gene so it is either inactivated or contains a desirable characteristic — for purposes of enhancing animal production or disease resistance.

Proving absence of risk

It's not that Walton opposes a cautious approach to adoption of new technologies. He does object to the Precautionary Principle as defined by an environmental activist groups' meeting at the Wingspread Conference in 1998. According to a statement adopted at that conference, "When an activity raises threats of harm to human health or the environment, precautionary measures should

be taken even if some cause-and-effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof."

According to Walton, that means adoption of a particular technology shown to increase food production without evidence of harm cannot proceed until it is proven, conclusively, to be without risk of any kind. Walton says that can't be done, because there are potential risks associated with virtually all activities, practices and methods.

"We cannot ever completely, literally prove the absence of risk. It's impossible. We can only scientifically assess the significance of potential risk," explains Walton, "and risk is often measured not by science and data, but by prejudices."

Walton said the Precautionary Principle too often twists and perverts reasonable caution, resulting in a decision that, in effect, calls progress less safe than what already exists. It does not consider the risks associated with doing nothing.

Issues with inaction

Emphasizing that inaction does have consequences, Walton cited examples. He started by explaining how the soil-dwelling bacterium *Bacillus thuringiensis* (Bt) was found to contain a protein with insecticidal properties. For 50 years, liquid sprays based on Bt protein have been used to control insects on crops. In the 1980s, crop plants were genetically engineered to produce the Bt protein affording insect resistance. Bt varieties of corn and other crops have been grown in the United States since 1995, with

no adverse effects to animal or human safety.

"In India, they grow a kind of eggplant (brinjal) that is a staple crop," said Walton, noting how the plant is subject to a borer type of insect that can cause yield losses in excess of 75%. "A Bt variety of the eggplant was developed, but activists with prejudice against corporate agriculture stepped in, raised unfounded questions about its safety and blocked its release. As a result, farmers in India are still fighting borers with insecticide sprays undoubtedly more dangerous than genetically engineered plants."

Walton also explained how researchers used biotechnology to develop goats that produce milk high in lysozyme, an antibacterial enzyme that is naturally present in human breast milk, tears and saliva, and in egg whites. According to Walton, cheese-makers apply lysozyme to cheese rinds to control bacterial growth. Goats producing milk with elevated lysozyme content were

developed to help reduce chronic diarrhea and related mortality among human infants in developing countries. According to Walton, the company has been unable to secure Food and Drug Administration (FDA) approval, and has moved to Brazil.

Also targeting improved nutrition in developing countries, scientists genetically engineered Golden Rice, which contains a variety that produces beta-carotene — a precursor to vitamin A. Deficiency in vitamin A is blamed for blindness or deaths of millions of people in some 120 countries, with children and pregnant women comprising the majority of cases. Research suggested that

consuming a cup of Golden Rice daily could supply more than half of the recommended dietary intake of vitamin A. Despite extensive testing for safety, activists opposed to agricultural production using genetically modified organisms (GMOs) have been successful in halting further development of Golden Rice.

Walton said the Precautionary Principle impacts livestock industries, too, calling European bans on "hormone-treated" beef a direct result of the philosophy. Similarly, he said the principle is driving fears that antibiotic-resistant pathogens threaten human health because of antibiotic use in animals.

"Sponsors of these and other technologies hear, 'You're only doing it for profit,'" laments Walton. "This isn't just about our businesses, it's about the whole planet."



► "We must fight against prejudice that masquerades as precaution," said Mark Walton, a geneticist with Minnesota-based Recombinetics. "Innovation is stifled when public perception and government regulation [are] driven by the Precautionary Principle."

A Fish Story

“The problem with the Precautionary Principle is not that it leads in the wrong direction but that, if taken for all its worth, it leads in no direction at all.”

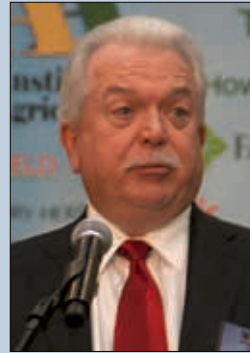
That is a fundamental truth, in the opinion of Ronald Stotish, president and CEO of AquaBounty Technologies. He shared that statement and a fish story during the recent National Institute for Animal Agriculture (NIAA) conference in Omaha. The story was about Massachusetts-based AquaBounty’s development of a genetically modified salmon.

According to Stotish, the company developed AquaAdvantage salmon by adding a growth-regulating gene from a Pacific Chinook salmon to the genome of an Atlantic salmon. The added gene speeds growth rate.

“AquaAdvantage salmon reach market size in about half of the time of conventional salmon,” explained Stotish. “They are more efficient, too, requiring 20% less feed.”

Following review of studies involving multiple generations of the AquaAdvantage salmon, the Food and Drug Administration (FDA) released a 2010 report calling it safe to consume as food. FDA concluded that it presented no significant risk to the environment under its conditions of use — fish farming utilizing land-based containment facilities with populations of sterile females.

However, environmental groups and the Alaskan salmon industry fought against approval of the advanced, hybrid salmon. Opponents cited concerns over food safety and potential crossbreeding and



► After 19 years of regulatory review and a \$70 million investment in the process, approval of AquaAdvantage salmon remains in limbo even though the FDA has concluded that it presents no significant risk to the environment under its conditions of use, said Ronald Stotish, president and CEO of AquaBounty Technologies.

environmental damage if AquaAdvantage salmon somehow escaped into the wild.

“Some opponents said it would kill you if eaten, and it would cause apocalyptic extinctions,” added Stotish.

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“There has been a corruption of the risk-assessment process. It is becoming subjective — a referendum process where personal and emotional preference is forced on all,” said Stotish. “It shows how the Precautionary Principle is the weapon of choice to prevent innovation.”

Walton said more thought should be given to the health and well-being of everyone and particularly the people in parts of the world where the natural resources necessary for food production are extremely limited. He cited the expected global population increase, from just more than 7 billion now to about 9½ billion by 2050.

“It is estimated that [globally] we will need as much food in the next 40 years as was produced during the last 10,000 years,” added Walton. “How are we going to do it?”

Asked if those involved in production of food should “go on the attack” against activists that oppose innovations in food production technology, Walton said more

champions for agricultural innovation are needed. He emphasized the significant disconnect between the general public and production agriculture. That makes it easier for messages of fear to spread.

Walton encouraged proponents for agriculture to be prepared to share the truth with those outside agriculture, especially those that may influence the regulatory process. However, don’t just sermonize. Listen to their point of view. Find out if they are open to discussion or “religious” about their current position. Walton warns that minds are hard to change if they are already closed.

“Don’t get hung up in fruitless arguments,” adds Walton. “Think about

which decision-makers may be subjected to their message; then make sure those decision-makers hear your message.”

Walton said false statements should be challenged, but proponents of innovation in agriculture should remain positive and polite. That doesn’t mean each and every technology is sacred, but neither should it be discounted out of hand. In every case, weigh the risk against the benefit.

“However,” states Walton, “it is a serious implication of the Precautionary Principle when the perception of risk is based on prejudice.”

Editor’s Note: Troy Smith is a cattleman and freelancer from Sargent, Neb.

