

## Stress Management in Fish with Bradan Pro-Tex™ - the Worlds First Nutritional Heat Shock Protein Accelerator.

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Fish, so recently domesticated from the wild, are particularly affected by stresses such as being handled, transported and vaccinated. These stresses in turn depress the immune system and also cause minor physical damage. These result in inappetance, poor growth, deformity and regularly lead to subsequent infection. Management of such stress is therefore a major factor in enabling good health and welfare.

Bradán in collaboration with leading scientists in the Universities of Idaho, Glasgow and Malta and major fish farming companies, has developed a unique stress management programme. Based on the strategic use of the remarkable feed additive Pro-Tex™ which is used in poultry production and also in stress management of show horses and human athletes, it represents a major step forward in the welfare and economic production of aquatic animals.

Pro-Tex™ is produced from a special strain of the Barbary fig, *Ficus opuntia indica* otherwise known as the prickly pear. It is obtained by extracting part of the fruit to yield a patented food material called TEX-OE® which has the ability to speed up the body's natural stress mediation system. Tex-OE® based products are now widely used in human cosmetics, in jet-lag remedies and in the poultry industry where they are fed to young birds at stressful times in the husbandry cycle.

Vascular plants can produce messenger substances that are able to transmit the signal calling for production of the stress or shock chaperone proteins, known as the Heat Shock Proteins (HSPs) and the Barbary fig has particularly good levels. Biologists have used these proteins, in tissue culture, to demonstrate that cells are protected when they are exposed to chemical, physical, disease-related or other forms of stress.

In mammals, the levels of HSPs in the blood usually take at least 2 hours to even begin to rise after exposure to stress or aggression. In fish, being cold blooded, it takes even longer after exposure to the stress, for them to appear in the circulation. Pro-Tex™ accelerates the appearance of these stress proteins following an aggression and they rise to higher levels. By repairing tissues more quickly, the cascade of harmful reactions is brought to a halt, the consumption of HSPs is reduced, and they remain present in the body at high

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levels, thus making the fish ready to cope with any further stresses. In cold water fishes, this benefit will last for at least four days after feeding or imbibing Pro-Tex™.

Pro-Tex™ is registered with the EU as a feed additive and can be supplied for use by adding to the water, for imbibing (Pro-Tex™ Hydro) or as a highly concentrated suspension in fish oil (Pro-Tex™ in oil) for use as a surface dressing for feed pellets for mixing on the farm. It can also be supplied as a mannitol based powder for inclusion within a pelleted diet at manufacture. It is FEMAS registered and since it is entirely of natural origin, can also be included in organic rations.

