

Induced inflammation in the Atlantic salmon intestine and epithelial responses.

Farmed Atlantic salmon is routinely fed with pellets containing vegetable ingredients. Certain plant proteins may induce an inflammatory environment in the intestinal tract of fish, and carcinogenesis has also been noted. The pathogenesis is similar to that of inflammatory bowel disease (IBD)-related cancer in humans.

A feed trial was designed to stimulate inflammation in experimental fish. Three separate groups were subjected to feeding regimes where two of the groups received feeds containing different plant ingredients (A and B), and a third group received a diet based on marine ingredients.

Immunohistochemistry (IHC) targeting CD3 $\epsilon$  and MHC class II were used to study the inflammation. Epithelial cells were identified with haematoxylin & eosin staining and IHC. A pan cytokeratin antibody was used to identify epithelial cells, and a proliferating cell nuclear antigen (PCNA) antibody was used to mark proliferating cells. Periodic acid Schiff (PAS) staining was used to detect mucins. The investigations revealed severe generalised inflammation and various amounts of dislocated epithelial cells in the fish receiving experimental diet B. The fish given experimental diet A was less affected. The control group almost devoid of dislocated epithelial cells. There was a clear association between inflammation and dislocated epithelial cells. The inflammatory response was dominated with T-cell infiltrates in a similar fashion as that seen in IBD-affected human intestine.

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