Die Hard - improving the physical quality of extruded fish feed pellets

The present thesis, Die Hard – Improving the Physical Quality of Extruded Fish Feed Pellets, approaches some of the biggest challenges within production of high-performance feed: Oil leakage and pellet strength. Salmon farmers in the aquaculture industry are requesting high energy dense diets with a supreme physical quality. To fulfil the market expectations, feed pellets have to contain 40% fat and tolerate high levels of stress during the transportation to the fish cages – without the pellets crumbling and oil leaking out of the feed. To solve this task, an improved understanding of the pellet structure’s impact on the physical quality of the feed is required. Through detailed analyses of the pellets’ microstructure, it was found that the optimal pore structure is defined by a high pore-surface-area to object-volume ratio. To obtain this pore structure, a new generation of dies was developed. These dies are proven to significantly reduce oil leakage while the overall pellet strength is significantly enhanced. The observations leading to the development of the new dies are published in the enclosed Paper I, whereas an application increasing the utilization of the pores is filed as Patent Application I, and the die technology facilitating an improved pore structure of extruded feed is filed as Patent Application II.

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