



**PROMOTION OF THE REGIONAL POLICY RECOMMENDATIONS FOR THE
DEVELOPMENT AND USE OF ALTERNATIVE DIETARY INGREDIENTS IN
AQUACULTURE FEED FORMULATIONS: ESTABLISHMENT OF THE REGIONAL
DATABASE OF ALTERNATIVE FEED INGREDIENTS IN AQUACULTURE**

Aquaculture Department

Executive Summary

Aquaculture has significantly contributed to food security and reduction of poverty in the region. However, this industry is challenged with the unsustainable dependence on fish meal and fish oil for nutrient protein and lipid, respectively. Thus, there is a need to expand research on fish meal substitutes or alternative ingredients.

During the 2001 ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the Third Millennium: “Fish for the People” and the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 in 2011, the Plan of Action towards ‘improvement of the efficient use of aquatic feeds by strictly regulating the quality of manufactured feeds and feed ingredients, providing guidelines on farm level feed conversion ratios and levels of aquaculture effluents, and supporting research into developing suitable alternative protein sources to reduce dependence on fish meal and other fish-based products’ was adopted. The need to fast-track the search for alternative protein sources in dietary formulations as well as facilitate the sharing of information in this area of research was also highlighted. The ASEAN Fisheries Consultative Forum (AFCF) likewise identified “the development of better feeds for sustainable aquaculture as one of the priority areas to be promoted in the ASEAN region and thus included this aspect in the AFCF Workplan (2011-2015) with Myanmar as the Lead Country.

Extensive research and development have been done and continue to be undertaken on nutritional requirements, alternative feed ingredients and their digestibility, fish meal and fish protein substitution in aquafeed and development of suitable feed formulations for a wide range of farmed species at various growth stages. However, information and valuable findings have not been widely disseminated. To facilitate exchange and sharing of information the Regional Technical Consultation on the Development and Use of Alternative Dietary Ingredients or Fish Meal Substitutes in Aquaculture Feed Formulation was organized by SEAFDEC/AQD in collaboration with the Department of Fisheries of Myanmar in 2014. Among the recommendations from the Consultation is the compilation of available information on alternative ingredients.

The database on alternative feed ingredients in aquaculture is envisioned to make available information on ingredients that are currently used or have been tested and shown to have the potential for use in aquaculture in the region readily accessible from a central site for easy reference of the different stakeholders.

Progress to Date:

As the lead Department for the creation of an Alternative Feed Ingredient Database in Southeast Asian Region, a technical working group composed of senior staff from the Nutrition and Feed Development Section, Research Division of AQD has been created. It has identified

several information and parameters relevant in the content design of the database. The list includes; name of the ingredient (local and scientific), proximate composition, species and stage of fish evaluated, per cent inclusion level in the feed formulation, processing methods of ingredient, effect of the ingredient in fish performance parameters and the characteristic of the ingredient detrimental to fish health.

Preliminary information in the database were derived from intensive scientific literature search. To date, the database contains nearly 100 types of ingredients and tested to several fish species. The list includes and highlights scientific papers which are generated from the studies of AQD. To host the database, a preliminary website (<http://nfds.seafdec.org.ph>) has been created and continues to be developed.

Focal persons have been identified by 8 out of 10 National Coordinators / Council Directors / Alternate Council Directors to acquire information on the use of alternative ingredients in member countries that have not been published or were published in the local language. Selections to complete the coordinators are still on-going.

AQD is also leading the proposal for a seminar-workshop on Alternative Feed Ingredient Database to be held in Bangkok within 2018. The date is yet to be finalized. The drafting of agenda, timetable and invitations are still in preparation.

Required Consideration by the Council

The 50th Meeting of the SEAFDEC Council Meeting is requested to give comments on the progress of the Establishment of the Regional Database of Alternative Feed Ingredients in Aquaculture. The Meeting is also requested to remind the countries that have not yet nominated their focal points to communicate with AQD.

Background/Rationale

Aquaculture production in Southeast Asia has markedly increased in recent years. Globally, roughly half of the fish supply comes from aquaculture. However, the aquaculture industry is challenged by issues related to feeds, being the largest single cost item in production accounting for about 50–60% of the total cost, including high feed conversion ratio (FCR), continued reliance on fish meal and fishery products and the pressing need for fish meal substitutes.

During the 2001 ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the Third Millennium: “Fish for the People”, the Plan of Action towards ‘improvement of the efficient use of aquatic feeds by strictly regulating the quality of manufactured feeds and feed ingredients, providing guidelines on farm level feed conversion ratios and levels of aquaculture effluents, and supporting research into developing suitable alternative protein sources to reduce dependence on fish meal and other fish-based products’ was adopted. As a follow-up, the Resolution and Plan of Action enjoining ASEAN member countries ‘to improve the efficient use of aquatic feeds by strictly regulating the quality of manufactured feeds and feed ingredients and support continued research for developing suitable alternative protein sources that will reduce the dependency on fish meal and other fish-based products’ was adopted by ASEAN Ministers and Senior Officials during the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security Towards 2020 in 2011. The need to fast-track the search for alternative protein sources in dietary formulations as well as facilitate the sharing of information in this area of research was also highlighted. On the other hand, the ASEAN Fisheries Consultative Forum (AFCF) identified “the development of better feeds for sustainable aquaculture as one of the priority areas to be promoted in the ASEAN region and thus included this aspect in the AFCF Workplan (2011-2015) with Myanmar as the Lead Country.

Extensive research and development have been done and continue to be undertaken on nutritional requirements, alternative feed ingredients and their digestibility, fish meal and fish protein substitution in aquafeed and development of suitable feed formulations for a wide range of farmed species at various growth stages. However, information and valuable findings have not been widely disseminated. To address this issue and to facilitate exchange and sharing of information the Regional Technical Consultation on the Development and Use of Alternative Dietary Ingredients or Fish Meal Substitutes in Aquaculture Feed Formulation was organized by SEAFDEC/AQD in collaboration with the Department of Fisheries of Myanmar in 2014.

The recommendations from the Consultation include: compilation of available information on alternative plant products, develop locally-available alternative ingredients, each country to conduct national assessment of ingredients in terms of availability, sourcing sustainability and cost effectiveness which will lead to selection of specific ingredients in the country, promote mass production of protein sources/ingredients that are found appropriate after each country’s assessment, implement a policy facilitating the outsourcing of alternative ingredients, increase investments in R&D including processing to improve nutritional value of alternative ingredients, improve digestibility of plant protein ingredients, improve efficiency of feeds, determine optimum inclusion levels of the alternative ingredients and response of the species (e.g. effect on growth, meat quality), and conduct demonstration or field trials (comparing the use of traditional feeds and those using new alternative ingredients).

The creation of the database on alternative feed ingredients in aquaculture addresses some of the recommendations from the Consultation especially those centered on compilation of available information and making these easily accessible to the different stakeholders. Information from the database will serve as a guide for aquaculture feed manufacturers, fish farmers who are into the use of feeds prepared on-farm and those seeking knowledge on the ingredient materials that are currently used or have been tested and shown to have the potential for use in aquaculture in the region. The database would allow end users to understand the different properties of a specific feed ingredient in aquaculture. The directory is composed of the locally available

ingredients in the region, test animal (fish species), optimal inclusion level in the feed, nutrient composition, functional properties and the effects on fish performance parameters.

Objectives

The main objective of this undertaking is to put together all available important information regarding alternative ingredients for aquaculture in the region in one, easy to access site. The database is envisioned to be dynamic and will be updated as new information becomes available.

Description of Activities

A database of alternative feed ingredients is being put together. This initiative is undertaken by the Nutrition and Feed Development Section of SEAFDEC/AQD. The database consists of a list of ingredients tested in feeds for aquatic organisms and includes information on the type of ingredient (e.g. plant; leaf meal), species where the feed ingredient was tested (e.g. carp; scientific name and local name included), life stage of animals used for testing (e.g. fingerlings), nutrient profile (protein, fat, NFE, fiber, ash content), inclusion level of the ingredient in the feed, % of fishmeal (or soybean meal) replaced by the alternative ingredient, apparent digestibility (dry matter, protein or fat), presence of anti-nutritional factors (e.g. tannins), processing methods used and effect on quality of ingredient (e.g. dehulling; removal of anti-nutritional factors), limiting factor(s) e.g. high fiber content, other relevant information and references.

Initially, information gathered from work of SEAFDEC/AQD on alternative feed ingredients will be inputted into the database. Information from published studies on alternative ingredients used in aquafeeds will likewise be included. Efforts will be exerted to gather information on R&D on the use of alternative ingredients in member countries that have not been published or published in the local language. In order to realize this, the team will collaborate with focal persons in the member countries who will later be identified in coordination of the respective National Coordinators/Council Directors/Alternate Council Directors.

Expected Outputs

The database is expected to serve as a central, easy to access reference and source of important information on alternative ingredients for aquaculture in the region.