PROTEIN PROCESSING



Fishmeal and fish-oil processing

Three fractions. One considered process.

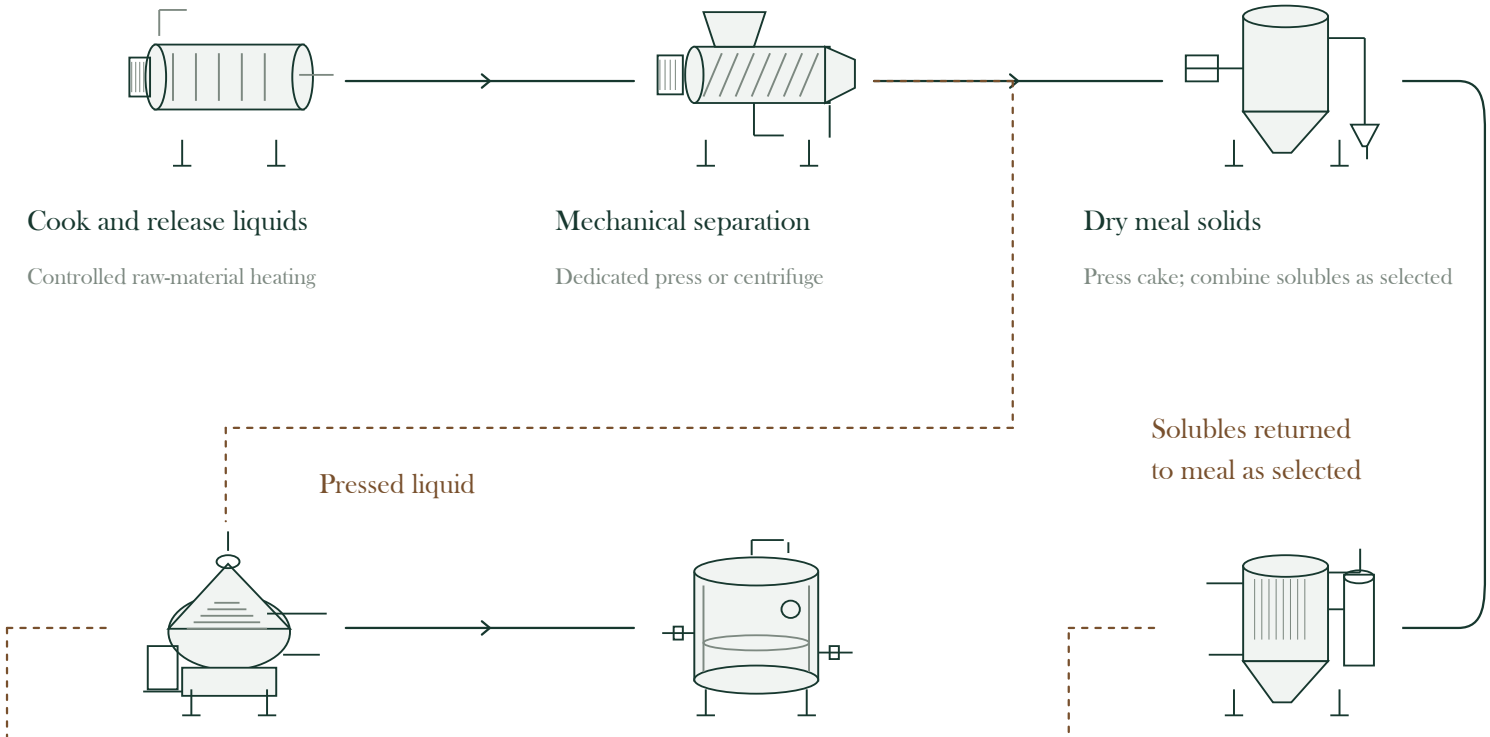
The condition of the raw material.

Photo / YeeLoon L.

MEAL / OIL / STICKWATER

Three fractions.
One connected material balance.

Specialist pressing and separation create distinct solids, oil and aqueous routes.



Dry meal proceeds to milling and storage. Evaporation vapour has a separate condenser duty; optional nitrogen boosting belongs to oil storage, not the solids line.

PROCESS STUDY / 01

Preserve the raw material before cooking

Fishmeal manufacture may use whole fish suitable for the route or fish-processing by-products. Raw-material condition, composition and storage influence both processing behaviour and final product quality. The selected wet process cooks the material to coagulate proteins and release oil and water. Dedicated mechanical separation then divides a solids-rich fraction from a liquid fraction; the arrangement may use pressing and centrifugation. These machines remain specialist equipment. Record the raw-material variability and the flow leaving each separation because the subsequent solids, oil and aqueous streams have very different transfer and thermal duties.



Freshness before processing.

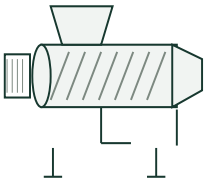
Photo / Andy Chilton

PROCESS STUDY / 02

Recover value from the liquid stream

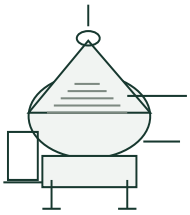
The liquid fraction contains oil, water and fine solids. Specialist clarification and oil separation recover the intended oil product while producing an aqueous stickwater stream. Concentrating stickwater can return soluble material to the meal route where the process design permits. Evaporation raises solids and viscosity, affecting circulation and fouling. Free Flow can be assessed for suitable particle-bearing heat duties, while a condenser serves a defined vapour load around the concentration system. Neither replaces the separators or complete evaporator. Oil recovery requires its own quality and handling assessment, including water removal and temperature management appropriate to the final use.

OPERATION STUDY / SELECTED PROCESS DETAILS



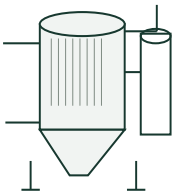
Separate solids and liquid

Use specialist pressing or centrifugal separation equipment.



Recover and finish oil

Separate the liquid fractions and direct oil to its own route.



Concentrate stickwater

Recover fish solubles from the aqueous liquid fraction.

Explanatory equipment studies / configuration, controls and treatment conditions follow the selected product route.

PROCESS STUDY / 03

Dry the meal and protect the oil



Bioceval fishmeal facility, Cuxhaven, Germany.

Photo / Gerd Fahrenhorst / CC BY 4.0 / cropped & resized

The solids fraction and recovered soluble material enter the selected drying route, then cooling, milling and storage or packaging. Drying must achieve the product specification without unnecessary thermal damage. Oil follows a separate storage and dispatch route; refined food-grade fish oil involves additional processing beyond this guide. If an engineered nitrogen system is chosen to limit oxidation in oil storage, a Mehrer booster can be assessed where the nitrogen source lacks the required pressure. Confirm purity and tank regulation independently. ABEL CM may be investigated for a defined residual-slurry transfer, with the actual solids and suction conditions; it does not establish suitability for every fish-processing waste.

SONFLOW / FREE FLOW

Assess a solids-bearing thermal duty

Free Flow is intended for particle-bearing and viscous media. It is a candidate for an appropriately prepared, pumpable liquid stream requiring heat transfer. The actual particle size and fouling behaviour must be checked before choosing the plate arrangement.

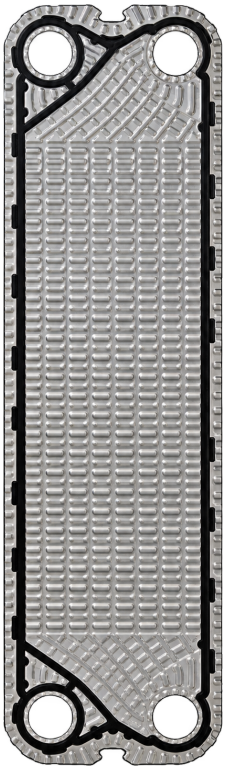
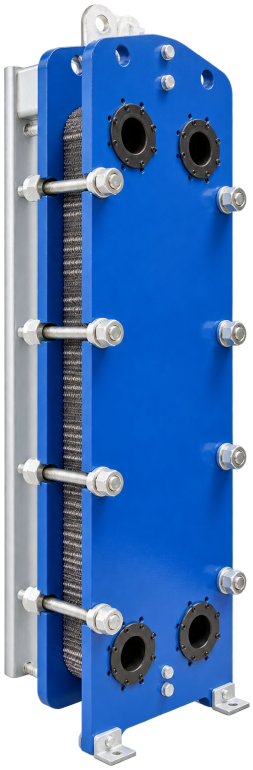


PLATE / FLOW PASSAGE



FRAME / COMPLETE UNIT

Not a fish cooker, whole-fish pump or separator; application suitability requires manufacturer and process confirmation.

EXPLORE SONFLOW /

SONFLOW / CONDENSER/EVAPORATOR

Manage low-pressure vapour

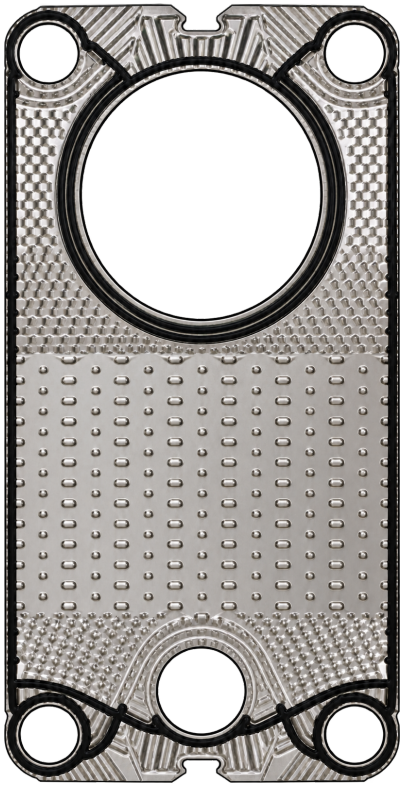


PLATE / FLOW PASSAGE



FRAME / COMPLETE UNIT

A concentration stage may create a low-pressure vapour duty. The SonFlow condenser family can be evaluated against that vapour load and cooling-water programme. Establish non-condensable content, vacuum conditions, pressure loss and cleaning access at system level.

Proposed condenser component within an engineered concentration plant; no claim to replace a complete fishmeal evaporator.

EXPLORE SONFLOW /

MEHRER / TZW / NITROGEN BOOSTER STUDY

Supply the pressure the gas route needs.



Assess nitrogen boosting only where the defined source pressure is insufficient for the engineered storage or packaging duty. Compression is one component of the gas supply.

MEHRER / TZW FAMILY STUDY

Confirm gas purity, inlet pressure, flow, cooling and regulation. A booster does not generate nitrogen or establish food-grade gas quality by itself.

EXPLORE MEHRER /

CONTROL THE PROCESS OUTCOME

Control both products.

Track incoming material condition, meal moisture, composition and relevant microbiological criteria. Oil quality also depends on oxidation, residual water and its intended market. Evaluate the actual temperature history and storage conditions of both streams. Cleaning requirements differ between raw reception, cooked fractions and finished storage. A pump image should be associated with its specific residual or liquid duty, rather than implying a complete fishmeal line.

The representative route starts with suitable raw material and heating to coagulate protein and release oil and water. Pressing or centrifugal equipment separates solids from liquids. Further liquid separation recovers oil and removes suspended material. The remaining stickwater contains dissolved and residual suspended material; it is concentrated for recovery of fish solubles. The concentrate can be returned to the solids stream before drying. Dry meal is milled and stored, while oil follows its own finishing and storage route. Plant layouts vary with raw material, quality targets and the selected separation technology.

THE RELEASE DECISION

Quality is demonstrated after the selected processing, transfer and finishing sequence. Define acceptance at the point where the product or recovered material is actually released.

THE AUXILIARY ROUTE

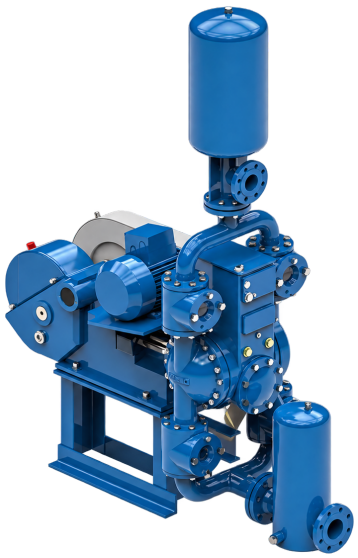
Retain soluble material deliberately.

A useful balance follows dry matter, water and oil through the separations. Recovering stickwater solids can change both yield and the drying load. Heat recovery needs a defined source and receiving circuit; vapour condensation requires adequate cooling and non-condensable handling. Include wastewater, odour-control and residual disposal duties in site integration. Seasonal supply changes utilisation and the economics of auxiliary gas or heat systems.



Industrial vessels and pipework; utility context

Photo / Crystal Kwok



ABEL / CM COMPACT DIAPHRAGM FAMILY

EXPLORE THE RELATED EQUIPMENT /

TURN THE ROUTE INTO A USEFUL ENQUIRY

Specify the material. Define the duty.

Provide the raw-material sources, anticipated variability and the selected food or feed destination. Map the existing heating, separation, oil and meal routes, then identify the liquid stream intended for thermal assessment. Include solids, viscosity, temperature, capacity and operating schedule. For concentration, document vapour conditions and cooling-water availability. Review the interaction between upstream separation and downstream concentration so that equipment duties reflect the actual plant rather than a generic diagram.

01 Raw fish/by-product composition

02 Solids and liquid separation rates

03 Stickwater viscosity and concentration

04 Meal drying and oil quality targets

05 Residual slurry and nitrogen-storage duty

RESEARCH BASIS / SELECTED PRIMARY REFERENCES

Protein-processing category and fish application context / Heating, separation and concentration stages / Conventional fishmeal/oil route and stickwater recovery / SonFlow / Free Flow / SonFlow / Condenser/Evaporator / DanPumps / S-IP/S-MP

PHOTOGRAPHIC REFERENCES

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BEGIN THE CONVERSATION

Your material.
Your next process.

Tell us about your stream, the operating conditions and the result you want to achieve.

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Fishmeal and fish-oil processing / Protein processing