A RESILIENT FOOD SYSTEM

Food side-stream valorisation

Value starts with the material.



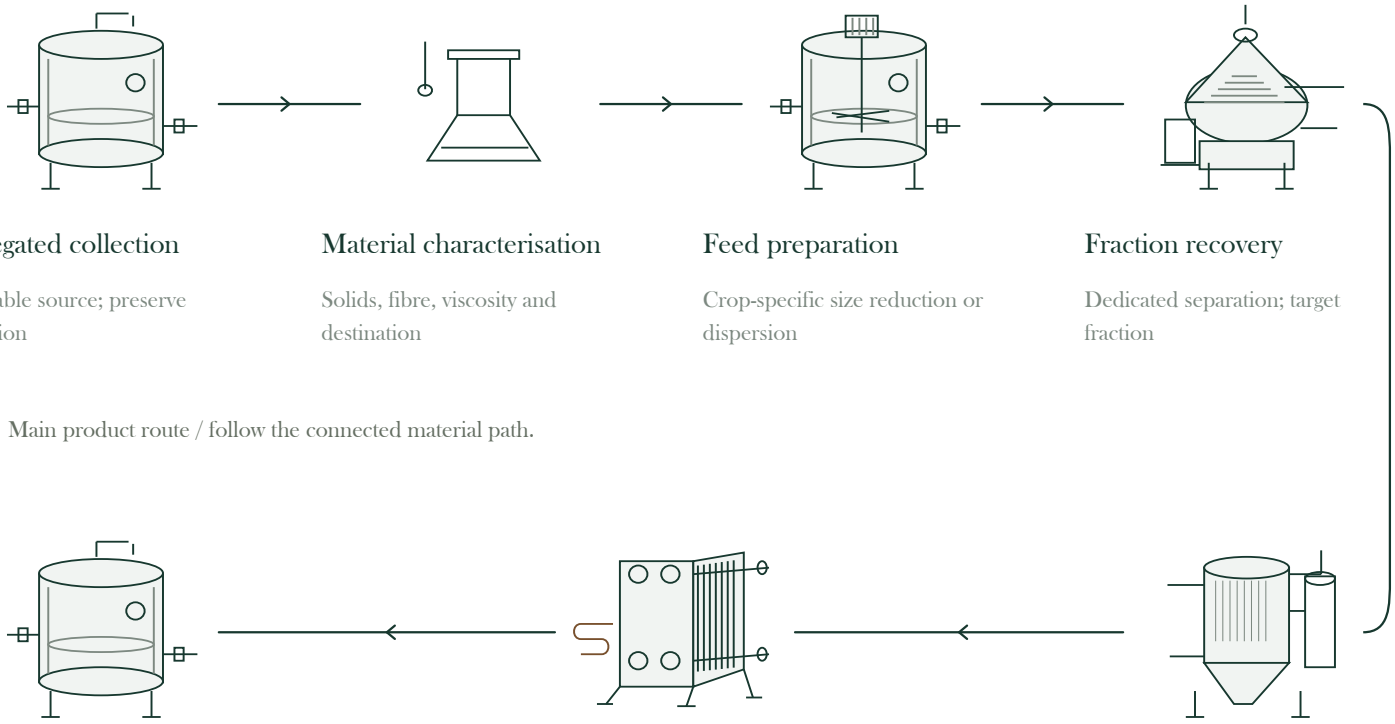
The material comes first.

Photo / Frank Albrecht

MATERIAL ROUTE / EQUIPMENT / BRANCHES

A recovery route, with separate destinations.

Selected side stream / recovery specification



Segregated collection

Traceable source; preserve condition

Material characterisation

Solids, fibre, viscosity and destination

Feed preparation

Crop-specific size reduction or dispersion

Fraction recovery

Dedicated separation; target fraction

Main product route / follow the connected material path.

Recovered ingredient

Defined outlet; controlled storage

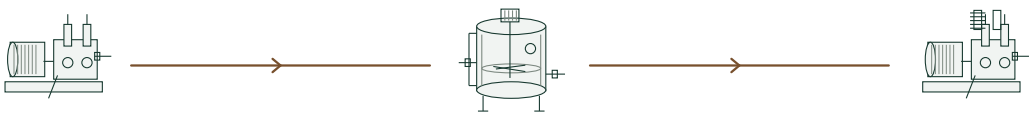
Stabilisation

Treatment and release specification

Concentration

Optional water removal; vapour duty

Residues leave recovery through an independent route.



Residual transfer

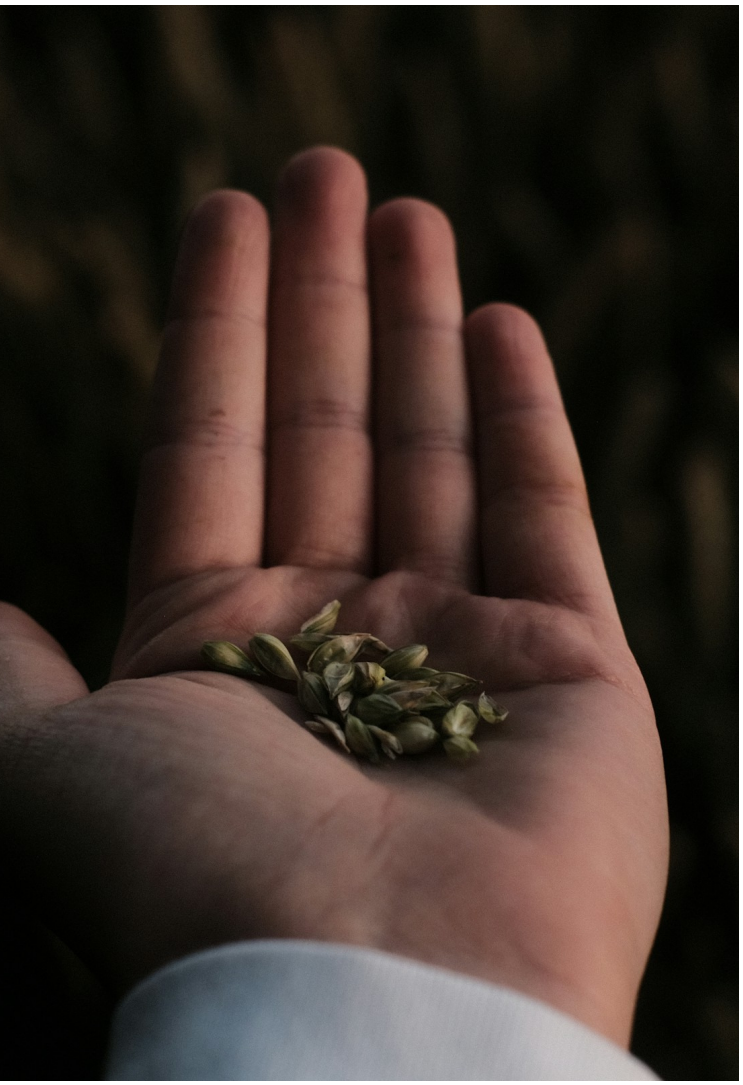
Digestion, if selected

Conditioned gas

SonFlow Free Flow / selected thermal duty; ABEL CM / residual transfer; Mehrer / conditioned-gas compression.

PROCESS STUDY / 01

Feedstock is a process specification



Raw seeds: preserving material identity before recovery.

Photo / Marc Kleen

A recovery project starts at the point where a material leaves its original production line. Keep spent grain, fruit pomace, whey-like liquids and wash water separate: mixing them can destroy an ingredient opportunity before any equipment is selected. Record origin, dry matter, particle size, temperature and the time available before deterioration. Food or feed use requires a suitable collection and preservation route; an energy route has a different specification. Screening removes foreign objects, while a dedicated separator or press may divide liquid and solids. A transfer pump moves that stream but does not perform this separation. Sampling over a full production cycle is more useful than a single average composition.

PROCESS STUDY / 02



Recover the fraction with a market

A wet side stream may contain a useful soluble fraction alongside insoluble fibres. Extraction, washing and specialist separation can recover that fraction, provided the product specification and economics justify the added water and subsequent concentration. Heating can help an extraction duty, while cooling can slow deterioration during intermediate storage. SonFlow Free Flow is a candidate where particles, fibres or viscosity rule out narrow passages. The channel selection still follows the actual material. Evaporation or drying comes after the recovery decision, not before it: concentrating an unsuitable mixed stream simply makes an expensive residue. Establish yield on a dry-matter basis and identify the destination of each separated fraction.

Industrial vessels and pipework; utility context

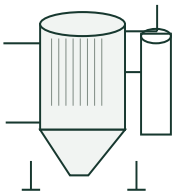
Photo / Crystal Kwok

PROCESS STUDY / 03

Where ingredient recovery ends

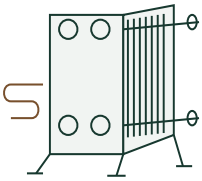
Some residues cannot enter a food or feed route. Anaerobic digestion can convert suitable organic material into biogas, followed by gas conditioning and a defined energy use. This is a separate plant, with its own biological loading and contaminant limits. An ABEL CM transfer duty can be assessed for pumpable residual slurry. On the gas side, a Mehrer compressor may boost conditioned gas to the pressure required by an engine or another downstream user. The illustrated TRE 200 is a family study, not a complete biogas installation. Gas composition, condensate, inlet pressure and required flow determine the compressor and ancillary equipment. Digestate remains another material stream requiring management.

OPERATION STUDY / SELECTED PROCESS DETAILS



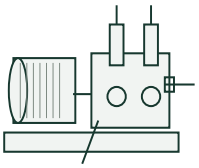
Concentrate as required

Remove water where concentration suits the product and process.



Stabilise and qualify

Confirm treatment, storage and acceptance criteria for the recovered fraction.



Manage the remainder

Treat residual water and solids through defined site routes.

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

SONFLOW / FREE FLOW

Make room for the feed

Free Flow can be assessed where a pumpable side stream contains fibres or particles. Its wider flow passages address a different duty from a narrow-channel exchanger. Check particle size, viscosity, fouling and the required thermal treatment.

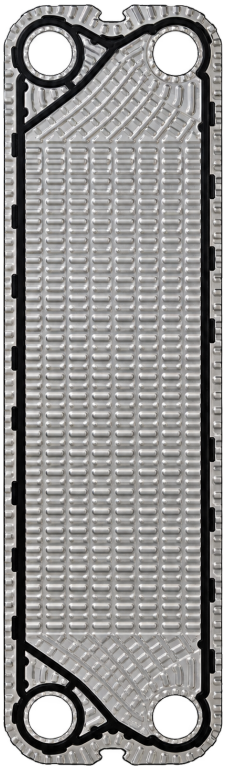
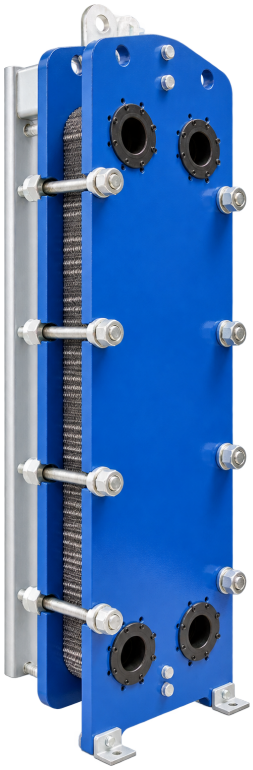


PLATE / FLOW PASSAGE



FRAME / COMPLETE UNIT

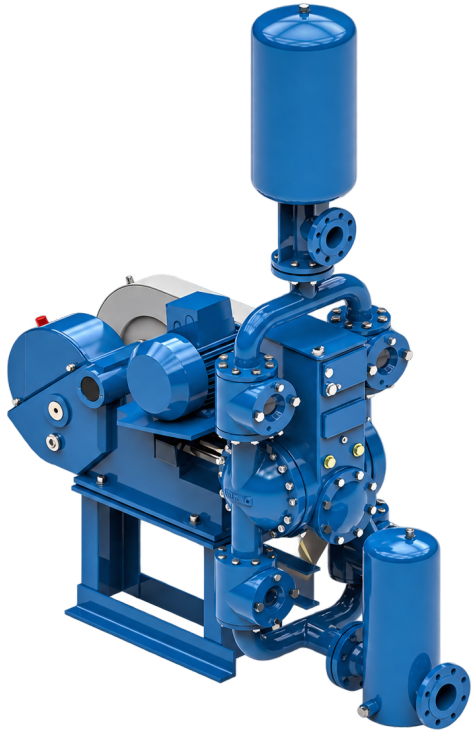
Candidate heat-transfer duty for characterised pumpable media, not for arbitrary whole grain, dry solids or every residue.

EXPLORE SONFLOW /

ABEL / CM / RESIDUAL-TRANSFER STUDY

Give residues their own route.

Assess a CM compact diaphragm pump for a defined pumpable residual or sludge stream. Select the material execution and valve arrangement for its composition, solids and pressure duty. Collection, equalisation and subsequent treatment remain separate parts of the plant.



ABEL / CM COMPACT DIAPHRAGM FAMILY

Confirm solids, particle passage, suction conditions, materials and the operating pressure range. This CM family illustration represents an auxiliary residual-stream assessment; the finished food or beverage follows its separately specified hygienic path.

EXPLORE ABEL /

MEHRER / GAS COMPRESSION / TRE 200 FAMILY STUDY

A pressure duty after gas conditioning.



Where the selected recovery route includes anaerobic digestion, investigate compression of conditioned biogas for its defined downstream use. The compressor follows the gas-quality and pressure specification.

MEHRER / TRE 200 FAMILY STUDY

The depicted TRE 200 is a family study. Digestion, gas purification, condensate handling and the receiving engine or network are separately engineered.

EXPLORE MEHRER /

CONTROL THE PROCESS OUTCOME

Preserve identity.

Traceability begins before collection. Define the permitted holding time, cleaning between batches and the destination of off-spec material. Ingredient recovery needs representative testing of composition, microbiology and functionality. A successful separation trial should document both the recovered fraction and the residue. A higher concentration alone does not demonstrate a better ingredient. Pump and heat-exchanger trials should use the real fibre and particle distribution rather than a clean substitute fluid.

WATCH THE INTERFACES

01 Dry matter and fibre distribution

02 Target ingredient and functional tests

03 Residue outlet and seasonal throughput

THE AUXILIARY ROUTE

Close a measured loop.

Compare the recovered value with added water, heating, cooling and transport. A wet ingredient route may avoid drying but needs nearby demand and controlled storage. Heat recovery can connect a warm outgoing stream with a compatible colder duty through separated circuits. Where digestion is selected, gas cleanup, compression electricity and seasonal demand belong in the balance. Credit a recovered material only when its actual use is established.



Drinking-water treatment plant; a reference for the dedicated water-treatment duty.

Photo / Eric Vance / US EPA

EXPLORE THE RELATED EQUIPMENT /

TURN THE ROUTE INTO A USEFUL ENQUIRY

Specify the material. Define the duty.

Define one feedstock, one target fraction and one destination for the first study. Supply representative samples and document how quickly the stream is collected after production. Establish variability across batches, temperature, solids and any additives already present. Provide the mass balance and the intended concentration or drying route. The recovery specialist can then confirm separation trials while the thermal and utility duties are sized around the results.

01 Origin and collection timing

02 Dry matter and fibre distribution

03 Target ingredient and functional tests

04 Heat source and receiving duty

05 Residue outlet and seasonal throughput

RESEARCH BASIS / SELECTED PRIMARY REFERENCES

By-product recovery and resource-efficiency framing / Example route: recovery of plant fractions / Evidence that recovered-stream condition and destination matter / SonFlow / Free Flow / SonFlow / Condenser/Evaporator / Skyven / Arcturus

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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