

ANIMAL FEED

1



EXPRESSIONS AROMATIQUES

yours flavourly

TABLE OF CONTENTS

I.	ANIMAL FEED MARKET	3
II.	PREMIX & ADDITIVES	9
III.	AQUACULTURE	17
IV.	OUR SOLUTIONS	22



ANIMAL FEED MARKET



DEFINITION

ANIMAL FEED

While pet food focuses on extending pets lives and guaranteeing their well-being, animal feed or livestock feed – such as for cattle or poultry – is designed to rapidly fatten-up the animal and is often mostly concerned with short term health.

TOP COMPANIES

EXAMPLES OF TOP ANIMAL FEED COMPANIES



CPF (Charoen Pokphand Foods) GROUP

Bangkok, Thailand

Livestock Feed

Chicken
Swine
Duck
Cow

Aquaculture Feed

Shrimp



NEW HOPE LIUHE CO.

Yunfu, China

Animal Feed

Livestock breeding
and raising



CARGILL INC.

Minnesota, U.S.

Animal Feed

Beef
Dairy
Equine
Poultry
Small Ruminants
Swine



LAND O'LAKES INC.

Minnesota, U.S.

Animal Feed

Beef
Dairy
Equine
Poultry
Swine
Goat
Sheep
Rabbit (...)



PALATABILITY OF ANIMAL FEED

Animals mostly rely on the sense of **TASTE** and **SMELL** to evaluate the desirability of the feed.

Unpleasant smell and taste of the food may lead to **REDUCED FEED INTAKE**.

Therefore, feed additives such as **FEED FLAVOURS** and **FEED SWEETENERS** are added to increase the consumption of even unpalatable feeds.

RUMINANTS

LARGE NUMBER OF TASTE BUDS

Chicken → 24

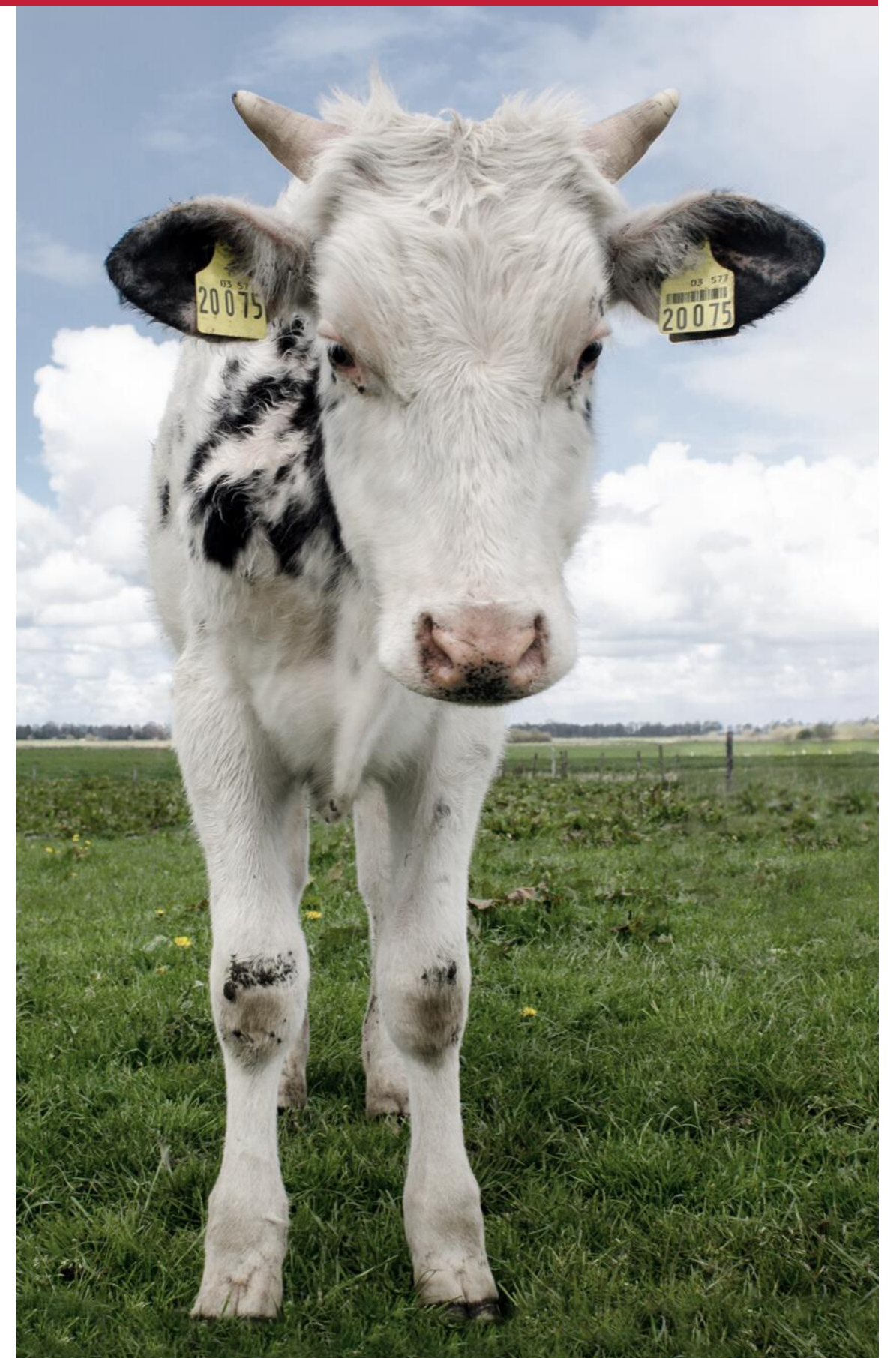
Human → 9 000

Cattle → approx. 25 000

Cattle show a better response to feed flavours due to a high number of taste buds.

CHEWING

The prolonged stay of feed in the mouth favour the solubility of flavouring agents, hence improving the taste and contributing further to improve feed intake and animal performance.



TOP FLAVOURS

FRUITS

MIXED BERRIES

STRAWBERRY

CHERRY

RASPBERRY

CITRUS

ORANGE

APPLE

APRICOT

RHUBARB

BANANA

PINEAPPLE

COCONUT

HERBS & SPICES

FENUGREEK

ANISE

ROSEMARY

LICORICE

PEPPERMINT / SPEARMINT

GARLIC

EUCALYPTUS

CINNAMON

GINGER

GRASS

GOURMET

VANILLA

MILK

HONEY

BUTTERSCOTCH

MOLASSES

CARAMEL / TOFFEE

TUTTI FRUTTI

CHOCOLATE

BUTTER

CREAM

ALMOND

PREMIX & ADDITIVES



PREMIX

Premixes are complex mix of vitamins, minerals, trace elements and other nutritional additives.

A premix is intended for incorporation in compound feed, feed materials or water and not meant for direct feeding to animals.



COMPOUND ANIMAL FEED



MASH

A fine mixture of ground grains, vitamins and minerals that an animal needs and has roughly the consistency of corn meal.



PELLETS

Finely ground mash feed converted into dense, free flowing pellets, in a process that involves steam injection and mechanical pressure.



CRUMBLE

Between a mash and a pellet, a crumble is a pellet that has been broken into smaller pieces.

TOP COMPANIES

EXAMPLES OF TOP COMPANIES IN THE FEED PREMIX MARKET



DSM
(Dutch State Mines)
Heerlen, Netherlands



BASF SE
Ludwigshafen,
Germany



ADM
(Archer Daniels Midland)
Illinois, U.S.



CARGILL INC.
Minnesota, U.S.



NUTRECO
Amersfoort,
Netherlands

ADDITIVES

ADDITIVES MAY BE ADDED TO COMPLETE FEED OR PREMIX

They can be divided into the following sub-categories:

- **Technological additives:** preservatives, antioxidants, emulsifiers, stabilizers, acidifying agents, additives for silage...
- **Sensory additives:** *flavours, colouring agents...*
- **Nutritional additives:** vitamins, amino-acids, trace elements...
- **Zootechnical additives:** improved digestion, intestinal flora stabilizers...

REGULATION (EC) No 1831/2003 on additives for use in animal nutrition

ADDITIVES

SENSORY ADDITIVES CHARACTERISTICS

*Sensory additives are used to improve or change the **organoleptic properties** of Animal Feed products.*

Sensory additives are used to :

- Enhance the taste;
- Increase the palatability;
- Mask the taste and smell of other additives (*e.g. antibiotics*).

REGULATION (EC) No 1831/2003 on additives for use in animal nutrition

ADDITIVES MARKET

The global **Animal Feed Additives Market** size was above USD 16.5 billion in 2016 and should reach USD 25 billion by 2024.

Overall, **ASIA PACIFIC** witnessed the highest production levels and accounted for over 350 million tons in 2016.

Growing concerns for **SAFETY & QUALITY** of meat and meat products should drive global animal feed additives market size.

As **FEED FLAVOURS** can neutralise the **BITTER TASTE** of antibiotics and other additives used to ensure the safety and the quality of the meat, increasing demand for healthy meat for human consumption also fuels the growth of the **FEED FLAVOUR MARKET**.

ADDITIVES MARKET



CAGR = Compound Annual Growth Rate

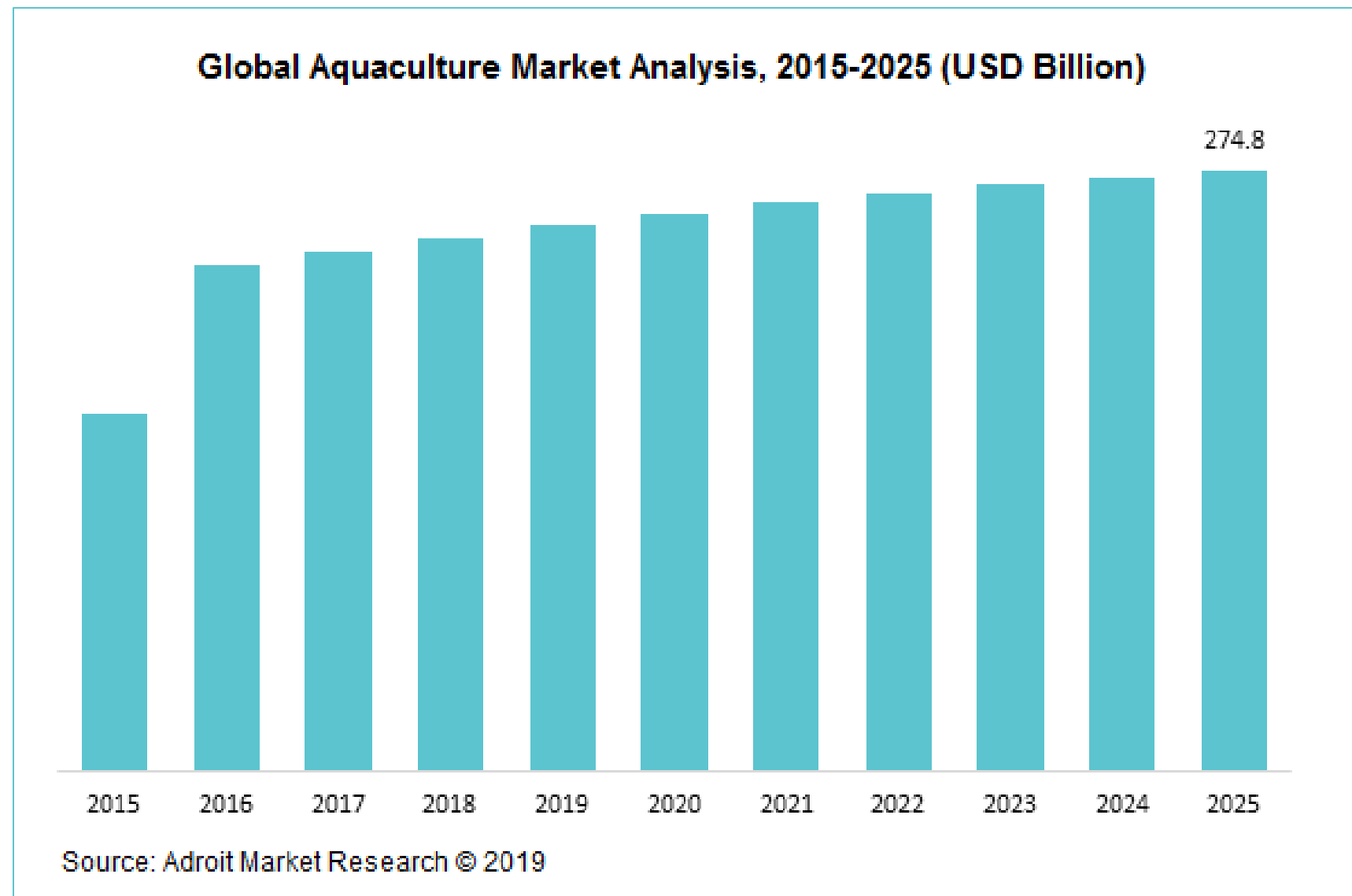
Source : Global Market Insights

AQUACULTURE



AQUACULTURE MARKET

Aquaculture or aqua-farming is the cultivation of fishes, molluscs, crustaceans and other aquatic organisms under controlled environments.



The global aquaculture market is expected to reach a market value of USD 274.8 billion by the end of 2025.

Aquaculture is contributory in **creating healthier marine habitats** and restoring & regenerating **rare fish species**.

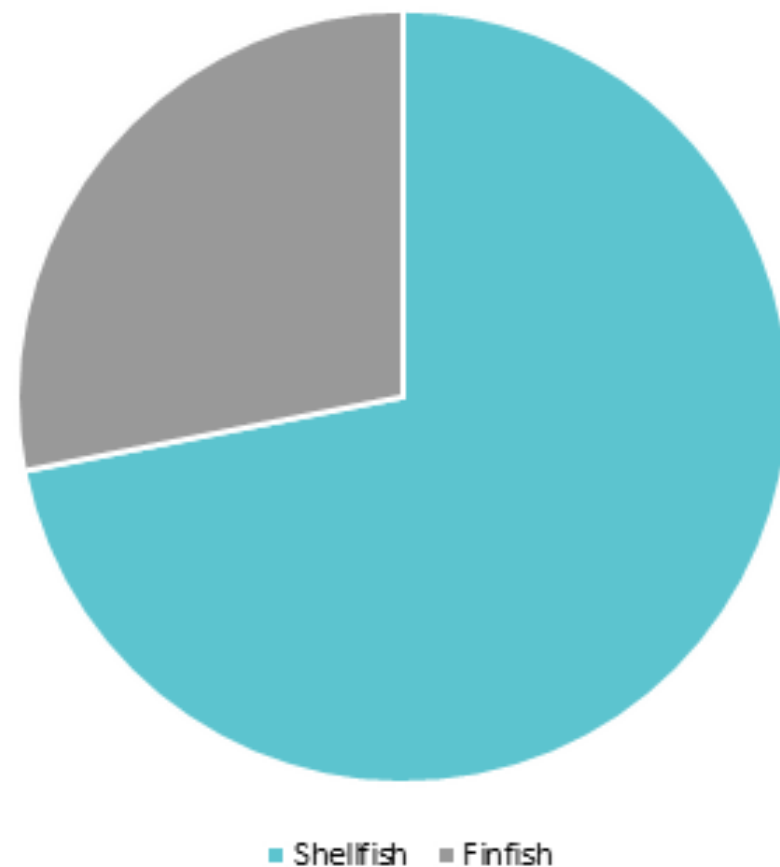
Most of the farmed fishes are utilized for food purposes due to the rising demand across the globe.

Source : Adroit Market Research

AQUACULTURE MARKET

Asia Pacific dominated the global market with **China** leading the region's production.

China Aquaculture Volume Market Share, By Fish Type, 2017 (%)



Source: Adroit Market Research © 2019

Chinese aquaculture output accounted for more than 60% of total global output, according to the Food and Agriculture Organization of the United Nation.

It is recognized that aquaculture provides **protein-rich food** and is **more efficient** than any other animal's production.

Seafood accounts for almost 16% of all animal protein consumption worldwide, and this ratio is expected to continue to rise.

Source : Adroit Market Research

AQUAFEED MARKET

Aquafeed are fish feed products made from vegetarian and non-vegetarian sources including soy, wheat, pea, corn, rapeseed protein and fish oils.

Aquafeed are added in trace amounts to enhance **omega 3** and **protein** concentration. Hence, rising awareness on benefits of omega 3 enriched seafood diet may drive aquafeed demand.

The global aquafeed market is expected to be worth USD 71.6 billion by 2025, growing at CAGR of 7.2% during the forecast period.

Asia Pacific is projected to witness the highest growth in the aquafeed market during the forecast period.

Europe aquafeed market size should register over 11% gains by 2026 driven by a change in consumer preference towards seafood.

CAGR = Compound Annual Growth Rate

AQUAFEED FLAVOURS

The diets of **CARNIVOROUS FISH** (mackerel, pike, snakehead, largehead hairtail, perch and eel) are often supplemented with fishy flavours.

While the diets of **HERBIVOROUS FISH** (grass carp, bream and blunt snout bream) are supplemented with sweet and herbal flavours.

Examples of aquafeed flavours

FISH MIX

SEAFOOD

PRAWN

SQUID

SALMON

GARLIC

OREGANO

MILK – VANILLA

MILK – STRAWBERRY

MILK – FRUITS

PERSIMMON

APPLE

OUR SOLUTIONS



OUR POWDER SOLUTIONS

Code	Designation	Max dosage in complete feed
FES 22295/1	Apple premixture	0.4 g/kg ^{1 2 3}
FES 22278/1	Orange premixture	Depends on the species. Contact us for more details.
FES 22279/1	Tutti frutti premixture	Depends on the species. Contact us for more details.
FES 22281/1	Coconut premixture	0.5 g/kg
FES 22282/1	Cherry premixture	12.5 g/kg ^{2 3}
FES 22283/2	Redcurrant premixture	Depends on the species. Contact us for more details.
FES 22287/1	Raspberry premixture	Depends on the species. Contact us for more details.
FES 22292	Strawberry premixture	8.3 g/kg ⁴
FES 22394	Wild strawberry premixture	Depends on the species. Contact us for more details.
FES 22224	Cream premixture	0.7 g/kg
FES 22280/1	Milk Vanilla premixture	No limitation
FES 22286/1	Milk premixture	No limitation
FES 22284/1	Vanilla Caramel premixture	No limitation
FES 22398/1	Vanilla Butter premixture	1.2 g/kg
FES 21901/2	Anise premixture	0.7 g/kg ^{1 2 3}
FES 22285/1	Thyme premixture	No limitation
FES 22625	Clove premixture	0.8 g/kg ^{2 3}
FES 22693	Lush grass premixture	0.055 g/kg
FES 22694/1	Grass premixture	0.25 g/kg
FES 23162	Garlic premixture	No limitation

¹ Prohibited for sea animals

² Prohibited for fish

³ Prohibited for poultry

⁴ Prohibited for sea aquaculture

OUR LIQUID SOLUTIONS

Code	Designation	Max dosage in complete feed
FEL 22556	Garlic premixture	No limitation
FEL 22556/1	Garlic premixture	No limitation
FEL 22648	Cabbage premixture	1 g/kg
FEL 22880	Cream premixture	1.6 g/kg
FEL 23323	Vanilla Caramel premixture	No limitation
FEL 23324	Milk Vanilla premixture	No limitation
FEL 23469	Apple premixture	0.4 g/kg ^{1 2 3}
FEL 23470	Cherry premixture	12.5 g/kg ^{2 3}

¹ Prohibited for sea animals

² Prohibited for fish

³ Prohibited for poultry