

**Market update – Global Feed
Ingredients Market, a view of
DSM as key player in this
market**

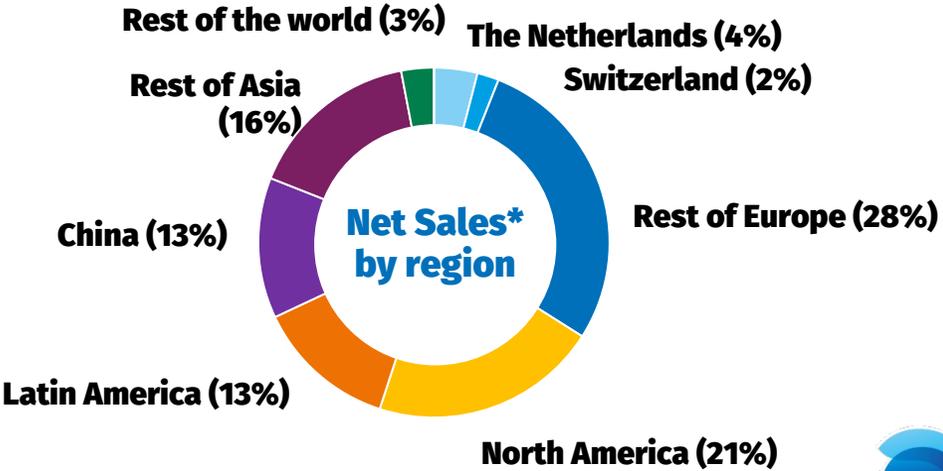
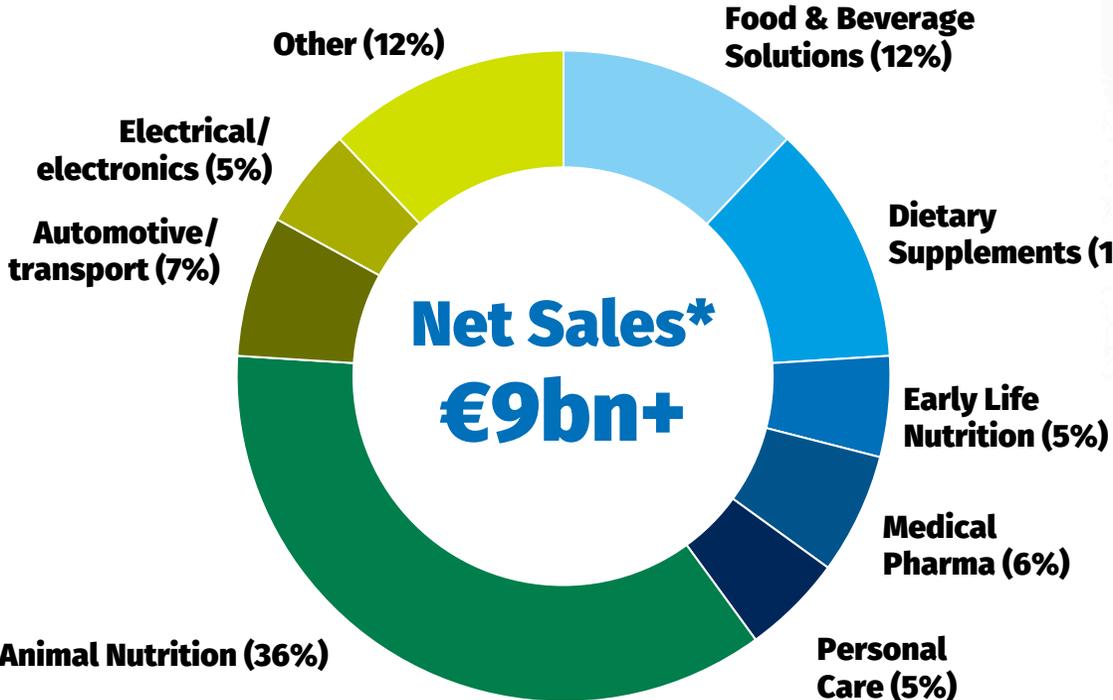
Royal DSM



DSM

BRIGHT SCIENCE. BRIGHTER LIVING.

DSM - Key player in the Global Feed Ingredients Market



2 * Including Materials business, currently being divested, full year 2021



DSM has the capability and the responsibility to make a meaningful impact

9B

GROWING POPULATION

By 2050 it's projected we will share our planet with 9 billion people



DSM has the capability and the responsibility to make a meaningful impact



DSM is fully focusing its resources on Health, Nutrition & Bioscience



Addressing these challenges offers exciting new market opportunities for DSM

400%

RESOURCE CONSUMPTION:

Resources demand expected to triple (overuse of the earth's capacity by > 400%)

Sustainable

ANIMAL PRODUCTION

Demand for animal protein is growing YOY. Making smart use of resources is key

Three Business Groups with clear end-market orientation



Animal Nutrition & Health

Radically more sustainable animal farming

€3.4bn*



Health, Nutrition & Care

Keeping the world's growing population healthy

€2.5bn*



Food & Beverage

Healthy diets for all through nutritious, delicious and sustainable solutions

€1.3bn*

Animal Nutrition & Health (ANH)

Sales
€3.4bn*



Poultry
46%



Swine
22%



Ruminants
23%



Aqua
9%

Key trends ...

Professionalization of farming and ensuring farmers can earn a living



Helping tackle antimicrobial resistance



Reducing reliance on marine resources



Making efficient use of natural resources



Reducing emissions from livestock



Improving lifetime performance of farm animals



Improving quality while reducing food loss & waste

... for which DSM is uniquely positioned

- **'We Make It Possible'** with our current comprehensive portfolio of market-leading probiotics, prebiotics, enzymes and eubiotics for animal gut health
- **World-leading science-based innovation program** has developed global game-changers such as methane-inhibiting feed additive Bovaer® and algae-based fish oil alternative Veramaris®
- **Unique global premix network** with strong representation in every region of the world
- **Leading advances in precision farming analytical/diagnostic services** such as Sustell™, Verax and Erber Diagnostics (Romer Labs®)

Recent acquisitions

Biomin



DSM Vitamins – A strong partner in a VUCA world

Cost-effective Vitamin forms for more Sustainable Farming



Over 100 years
Vitamin Science
(OVN®)

Unique Product
Forms (ROVIMIX®)

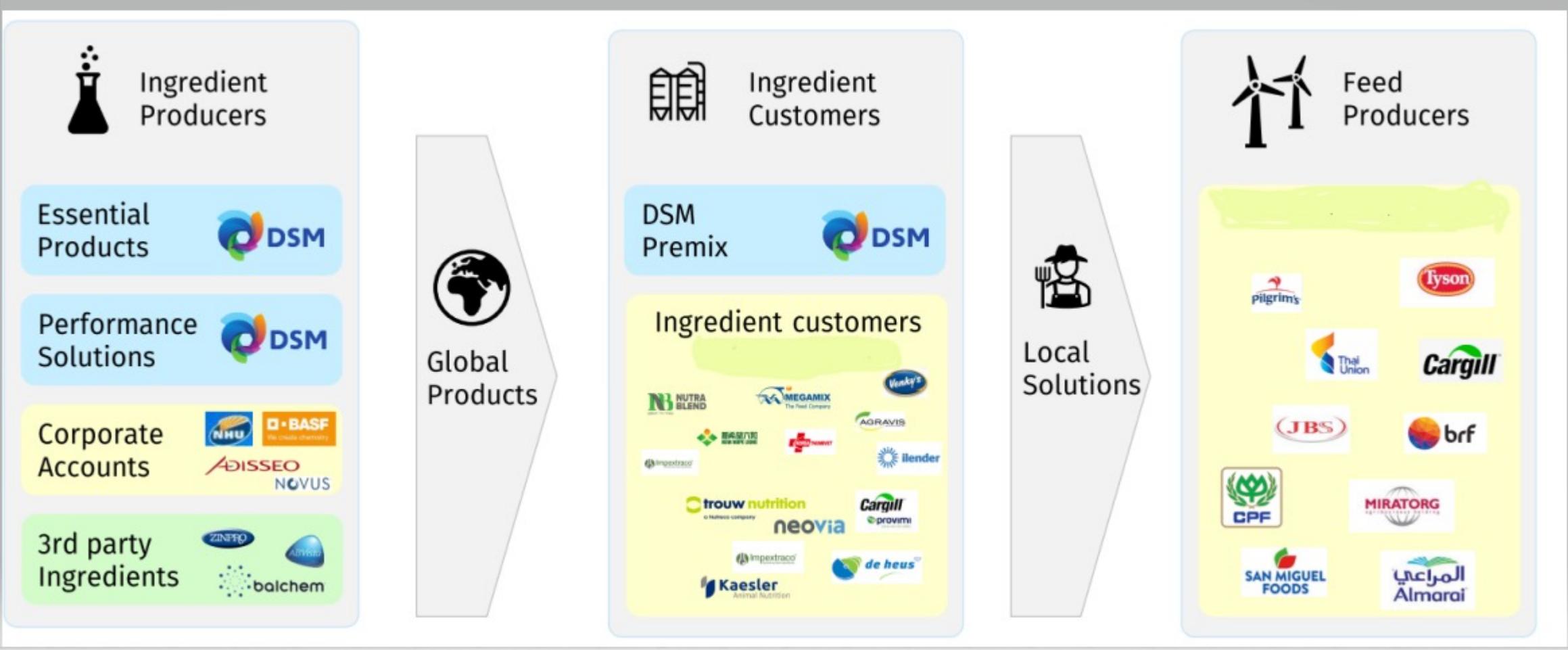
Secure Supply
& Peace of Mind
(Quality, Reliability,
Traceability, Safety)

Sustainable Vitamin
Producer



ROVIMIX® Vitamins provide a reliable and predictable content of Vitamins in your premix and feed. The secure supply from one of the world's leading sustainable food & feed vitamin producers is a cost-effective way to achieve the optimum health and performance that you expect in your animals for more sustainable farming.

DSM serves customers in every part of the value chain



DSM Feed Vitamin Market Update: Summary Q2 and outlook Q3

- **COVID-19 “zero-case” policy in China affecting demand**
- **Ukraine/Russia creating hyperinflationary environment**
- **Animal industry profitability under pressure**
- **Volatile Calpan prices**
- **Q3 outlook more positive than Q2**

China's COVID -19 Policy impact in Q2 might continue in Q3

Lockdowns crippling demand, high production costs, low meat prices resulting in negative margins for farmers and integrators

Pressure on pork prices, average margins under break-even

Q2 2022: meat production in China severely affected

- After a prolonged period of heavy losses, many Chinese hog farmers culled breeding sows and there is a real risk that many may decide to exit the business permanently
- Many producers have changed animal diet, from fattening to maintenance simply to keep animals alive (often taking out performance additives and keeping only the essential ingredients)
- Animal productivity becomes almost secondary, key focus is reduce cost if meat prices remain low

Pork News
China Farm Official Warns Against Excessive Culling of Breeding Sows
20 Apr 2022
Source: REUTERS

FT Financial Times
China's economic activity plummets as Covid lockdowns hit growth

China Lockdowns Cause Ripples in Meat Markets
09 May 2022
GLOBAL NEWS

Economy / China Economy

Coronavirus: China's travel sector, already on its knees, feels the pinch of a fresh outbreak

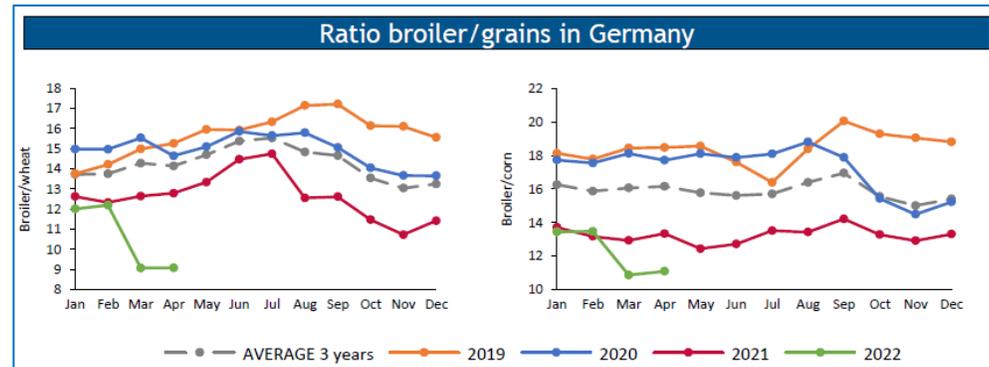
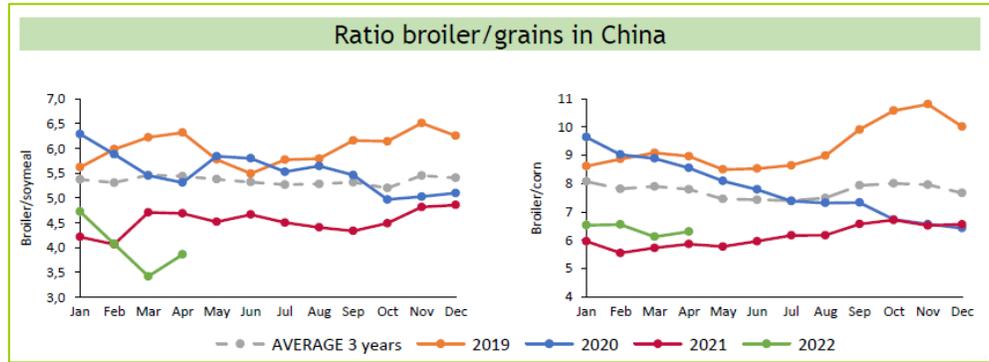
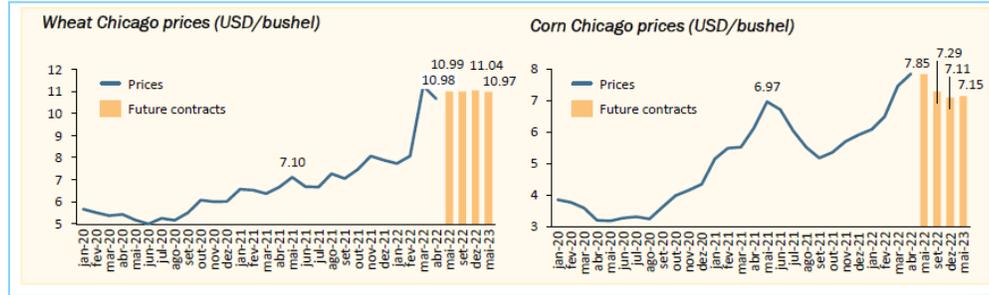
Q3 2022: Situation in China is still unpredictable

- many analysts expect Central Government to keep strict measures until general elections in the fall, but maybe there are temporary flexibility until then



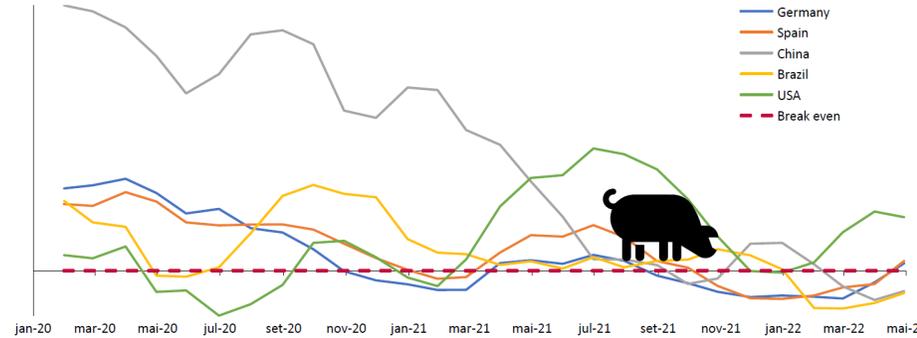
Ukraine – Russia war: global impact in energy, food and feed

Hyper-inflationary environment and low meat prices draining margins



2H 2022: better outlook expecting recovery in global demand and healthy supply

- Prices for many feed ingredients are likely to remain on the high end, but below Q1/Q2 peak
- With demand picking up again, meat prices should recover in many markets
- Summer holidays in northern hemisphere (and no travel restrictions in Europe or NA) should help to revive HoReCa segment and increase demand (at least in this segment)
- Situation in China still unpredictable



Estimated margin for swine producers: recovery in USA, Germany/Spain back to positive after 7 months in the red, Brazil and China still negative but improving

Source: DSM Business Intelligence

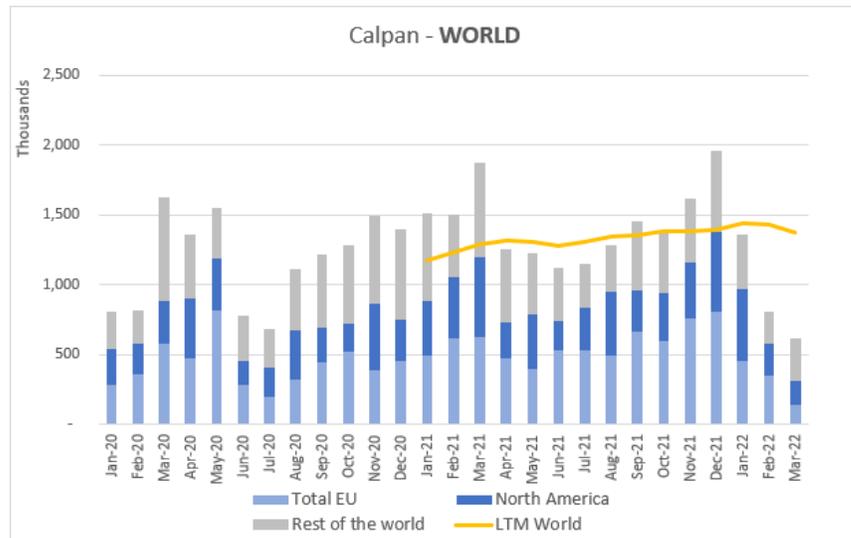


Volatile Calpan prices

Europe

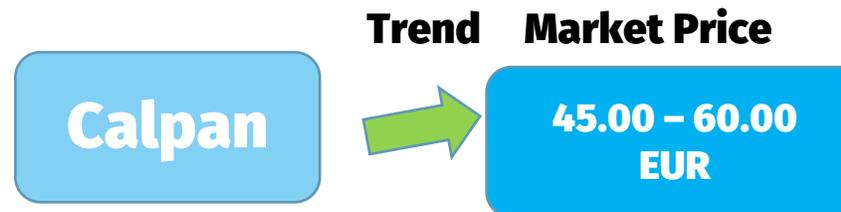


Source: FeedInfo (May 17th 2022)



- Rumors about new price increase expected in China in coming weeks
- DSM Dalry Calpan site: maintenance shutdown in June may have to be extended (anticipated) due to unforeseen production issues
- Q1/Q2 2022: despite much higher spot prices in China, Calpan prices in several markets lagged behind due to high inventories and previous supply agreements (at traders and customers) contracted earlier at lower prices
- Q3 2022: exports from China to ROW in recent months well below historical average → most Calpan inventories at “old” prices expected to be fully consumed by end of Q2

Different than in Q2 (replenishment costs were already high, but inventories were full of cheap Calpan), in Q3 most players (traders, premixers and feed producers) will enter the quarter with low inventories and replenishment will be done at very high prices, likely impacting premix prices as well



Feed Info

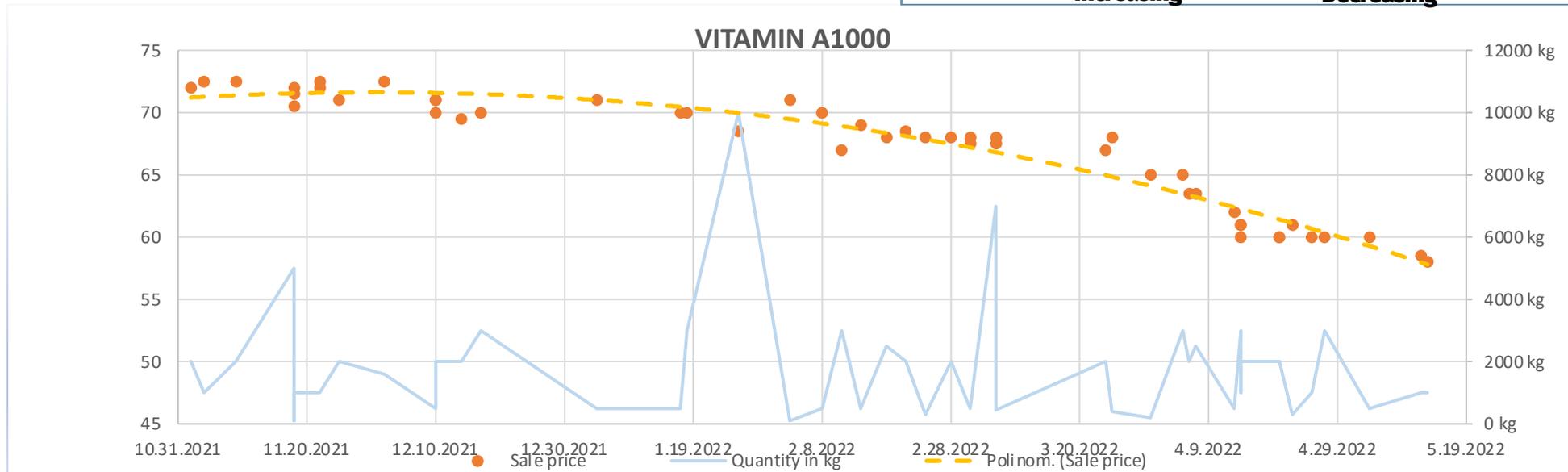
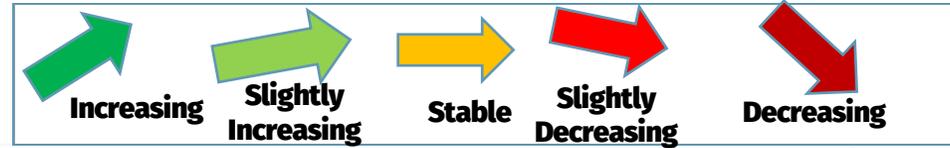
D-Calpan
EUROPE
17 May 2022

DDP NW EUROPE - €/KG

↑ 50.00 - 68.00

Uncertainty regarding Covid related shutdowns are causing some nervousness. DSM will shutdown its Vit A plant in Switzerland again in 2022 and conduct a 9-week maintenance, also has delays in replenishments of CN plant for main ingredient of Vit A acetate; already agreed Q3 commitments can be respected, however, DSM will be forced to prioritize its premix demand and limit offers elsewhere. BASF is in 8-week shutdown since mid April. NHU also announced an 8 week shutdown as of mid June.

Vitamin A



Trend



Market Price

**57-60 EUR
(A1000)**

Feed Info

Vitamin A 1000

EUROPE

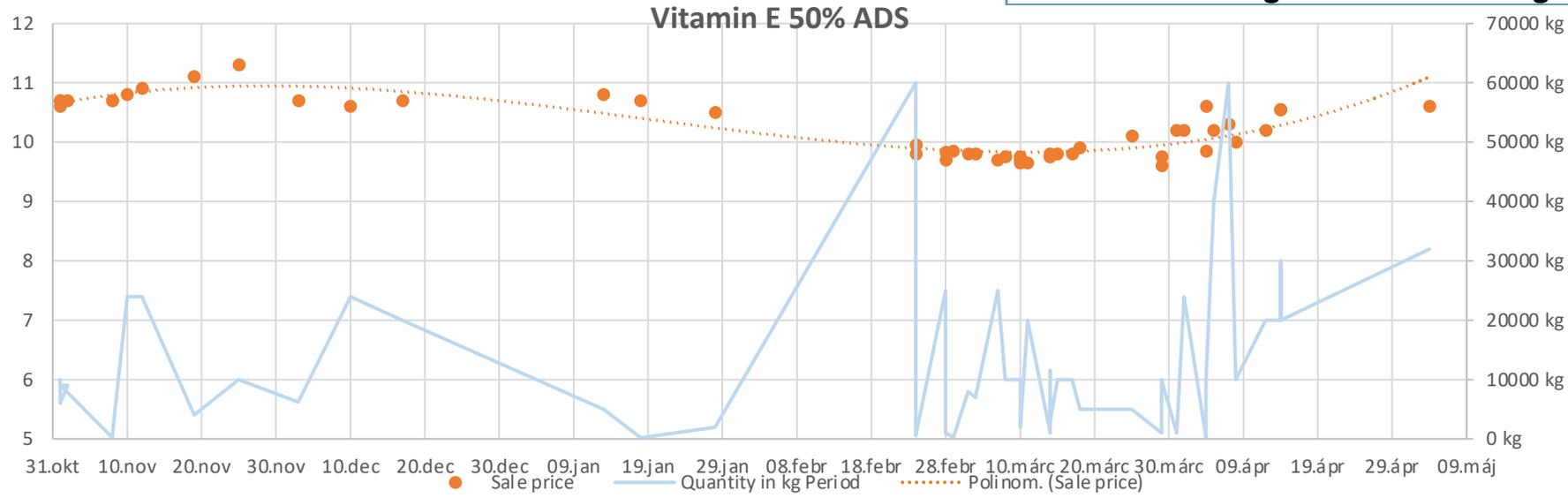
17 May 2022

DDP NW EUROPE - €/KG

58.00 - 64.00

Low demand is leading to a perceived good supply and prices for spot offers are softening a bit. However, supply remains restricted for most players (NHU, ZMC, Beisha and DSM) due to limited intermediates availability and the disruptions in logistics/ports. Unexpected Covid related shutdowns are causing further supply uncertainty and first customers start looking for forward coverage into Q3.

Vitamin E



Trend

Market Price

Feed Info

Vitamin E



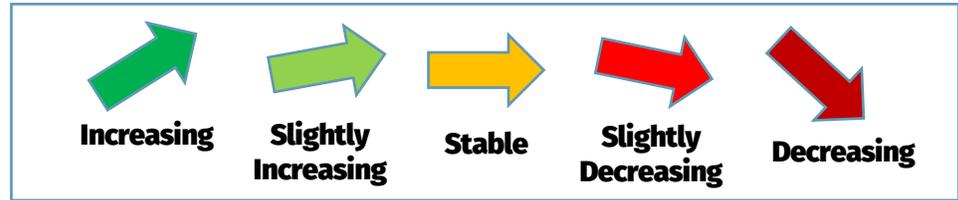
**10.00 – 10.80
EUR**

Vitamin E 50%
EUROPE
17 May 2022

DDP NW EUROPE - €/KG
9.75 - 10.30



Other Vitamins Price Trends



Vitamin D

Market softened earlier due to spillover effects of low demand in China, but bottom seems reached. Hisound had troubles with manufacturing license and got fined and stopped producing till improvements are done. Market covered for Q2.

Trend



Market Price

11.00 – 12.00 EUR

Niacin

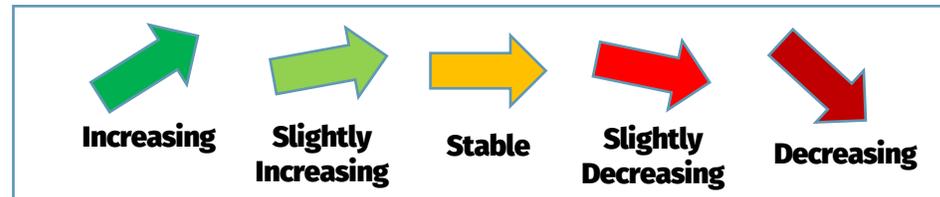
Lack of spot business had a short-term softening effect on the market. Jubilant had the year-end closing end Q1 and booked some deals at lower levels, as expected. Chinese producers allowed contracts at lower levels, before increasing the price expectations in local China. With Indians somewhat firmer as well, the market has upward potential



6.35 – 6.90 EUR

Price Trends

Other Vitamins



	Commentary	Trend	Market Price
B1	After price peak in Q4 21, Chinese producers resumed normal operation. With low demand and abundant supply, prices weakened. Availability for prompt deliveries is good	Stable	19.00 – 21.00 EUR
B2	All producers (Europe and China) are faced with much higher production costs due to corn (C-source for fermentation) and energy. European B2 prices are firm due to limited availability from BASF and DSM, in China prices are stable at low levels due to low demand	Stable	16.10 – 16.50 EUR
B6	Supply improved, but production costs remain high. With NHU entering B6 market and weak demand, prices in China have weakened a bit vs. peak level and is impacting other markets	Slightly Decreasing	18.00 – 19.50 EUR
Folic	After peak in Dec, prices have come back down to previous level. Due to high cost of ABGA/TAP, producers indicate that current level is close to bottom	Slightly Decreasing	36.00 – 38.50 EUR
B12	In CN supply higher than Demand, In Europe high levels due to anticipation of EFSA ruling will restrict availability	Stable	19.00 – 23.00 UR
Vit C	Market faced supply issues and high production costs. Prices for Q2 are down again. Uncertainty about supply China can change the market	Slightly Decreasing	3.50 – 5.00 EUR
Biotin	Prices came down a bit and is now flat. No big demand. Pure form at around € 325	Stable	6.80 – 8.00 EUR
K3 (MNB)	Supply remains tight and prices of Sodium Dichromate have gone up due Ukraine/Russia war, so that K3 production costs remain elevated in Q2. Further volatility in prices can be expected in coming months.	Stable	28.50 – 31.0 EUR

Changed fundamentals impacting the market for Amino Acids

- **For all production locations globally the cost price for amino acid production has at least doubled compared to last year:**
 - **For DL-Methionine: Methylmercapthan/Propylene/Ammonia and natural gas, energy**
 - **For fermentation based amino's: Corn/sugar, energy/steam, ammonia, HCl/Sulphate and transport**
- **Supply chain disruptions: caused by Force Majeure, availability of containers/vessels, increased transport prices, COVID, etc.**

	World demand	Europe demand	Price H1-2022	Price H2-2022	Availability	Remark / constrain	Production situation
DL-Meth	+ 5%	+ 2%	3.00-3.50	Stable/weak	sufficient	Russian ban EU producers	++
Lys	+ 3%	0 / -	2.00-8.00	Stable/firm	Adequate	Supply Chain and contingent	Stable to lower output
THR	+ 4%	+ 1%	2.00 – 4.50	Stable	Balanced	No additional capacities	Stable to lower output
TRP	+ 20%	+ 15%	8.00 – 10.00	Stable-firm	Balanced	EU authorizations limited	Stable output
VAL	+ 25%	+ 20%	6.00 – 8.50	Stable-firm	Balanced	EU authorizations limited	Campaign wise production
Other AA	+++	+++++	Up	Firm	Tight	EU authorizations limited	New entrances/campaign wise production

Attention points for H2 2022 - 2023

Physical availability is key

- **Availability / price of raw materials will define feed formulations**
- **Focus on local produced products / less dependent on imports**
- **Supply Chain issues will remain**
- **Transport costs remain at high level**
- **Increased knowledge/usage of new generation amino acids like Arginine, Histidine, (Iso)Leucine**

- **“New parameters”:** sustainable animal protein production
 - **Focus on N-utilization (protease and digestibility crude protein/ low CP diets)**
 - **Focus on CO2 reduction (Scope3)**
 - **Less SBM usage**



Summary Q2 and outlook Q3

Challenging Q2 but more positive Q3, despite some ongoing challenges

- **Very weak overall demand in Q2 for feed ingredients and meat (among others, result of crippled Chinese economy due to lockdowns and “zero-case” COVID policy) caused severe price erosion in vitamins and meat**
- **At the same time, Ukraine/Russia war created hyperinflationary environment for grains and energy**
- **With that, profitability became an issue in animal industry, especially in China, causing culling of animals (incl. breedings) and farmers permanently exiting the market**
- **Despite lockdowns and delays, overall global logistics and supply chain somehow managed to keep functioning, so that despite higher costs and lower returns, markets were sufficiently served and had access to needed raw materials and ingredients to keep on operating, feeding and slaughtering animals**
- **More positive outlook in Q3: grain and energy prices will probably come slightly down from peak in Q1/Q2 (even though still at very high levels), demand should start to recover, also driven by summer holidays in northern hemisphere without any travel or COVID restrictions (i.e. positive outlook for HoReCa segment)**
- **Remaining challenges for Q3: most premixers, feed producers and integrators enter Q3 with rather low inventories (less purchases due to uncertainty in demand, lack of cash, unreliable logistics, etc.) and are exposed to volatile prices of key cost drivers such as minerals, phosphates, amino acids and vitamins such as vitamin E and Calpan**
- **Priority for many players in Q3 will be to recover (protect) margins, focusing on value over volume**

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