

JUNE 1 - 3
SKAGEN
DENMARK

Jonathan
Barberá
Rico

R&D Director, 3A
Antioxidants

Alternatives to the Natural Antioxidant
Tocopherol for the Stabilization of Fishmeal



ALTERNATIVES TO THE NATURAL ANTIOXIDANT TOCOPHEROL FOR THE STABILIZATION FISH MEAL



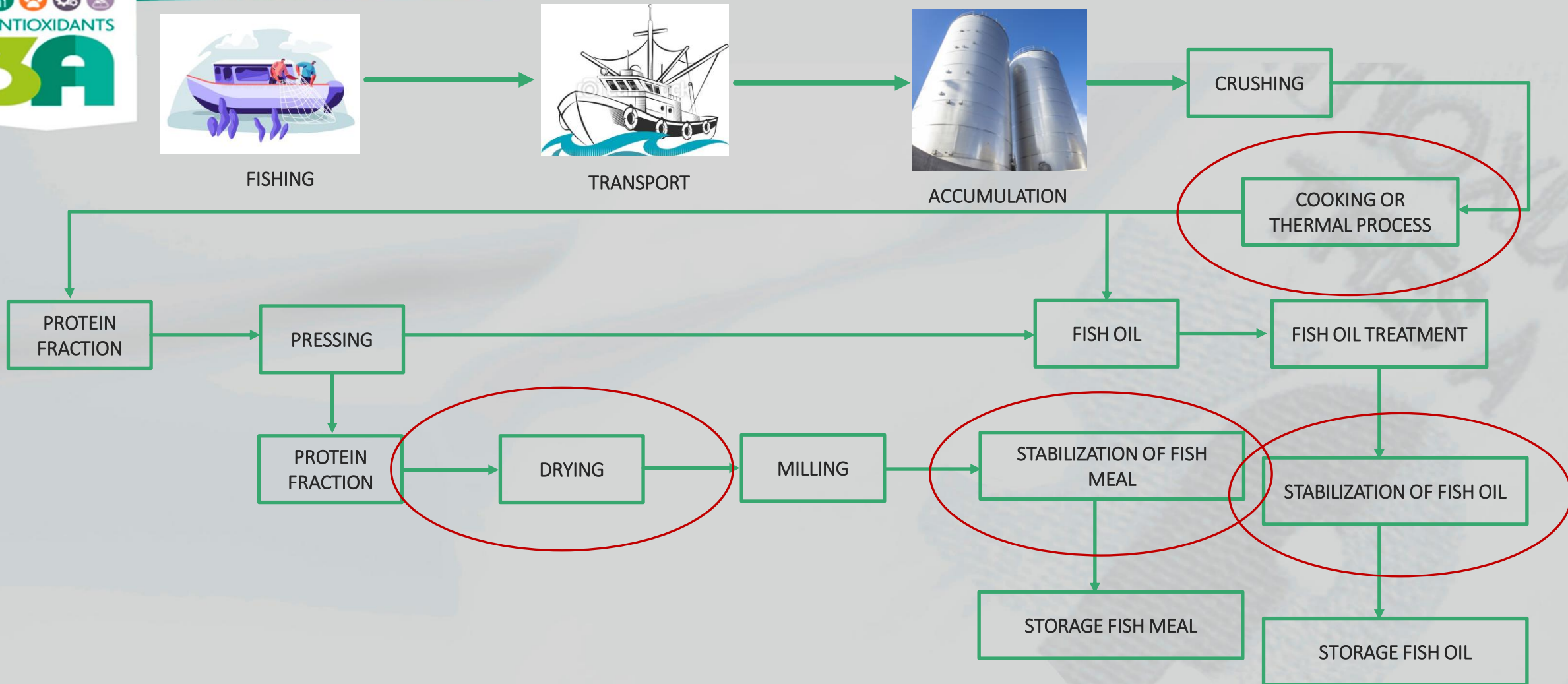
03.06.2022

TECHNICAL DEPARTMENT

Jonathan Barbera

INDEX:

1. FISH OIL AND MEAL PRODUCTION
2. RESTRICTION FOR THE MARINE TRANSPORT
3. TOCOPHEROL MARKET SITUATION AND TENDENCY
4. OPTIONS AND STRATEGIES FOR THE STABLIZATION
5. CONCLUSIONS



FACTORS IMPACT IN THE OXIDATION STAGE

1. FEEDING OF FISH
2. STRESS OF FISH DURING CATCHING
3. TIME LAPSE BEFORE THE PROCESS
4. CRUSHING
5. COOKING PROCESS
6. DRYING
7. MIXING WITH THE ANTIOXIDANT
8. TYPE OF ANTIOXIDANT

CONCERNS IN THE MIXING

1. WETTING THE SURFACE OF THE MIXER
2. TOO MUCH HEIGHT BETWEEN THE SPRAY OF ANTIOXIDANT AND MEAL
3. FREQUENCY OF THE SPRAY
4. INTERNAL AIR CURRENT MOVES THE ANTIOXIDANT CURRENT IN THE LONGITUDENAL AXIS
5. NO CONSTANT MEAL FLOW THROUGH THE MIXER
6. SPRAY PATTERN IS NOT FULL CONE



INDEX:

1. FISH OIL AND MEAL PRODUCTION
2. RESTRICTION FOR THE MARINE TRANSPORT
3. TOCOPHEROL MARKET SITUATION AND TENDENCY
4. OPTIONS AND STRATEGIES FOR THE STABLIZATION
5. CONCLUSIONS

IMDG CODE

MOISTURE CONTENT	5 – 12%	5 – 12%
FAT CONTENT	< 12%	< 15%
ANTIOXIDANT	NON TREATED	TREATED
CLASS	4.2	9
UN N°	1374	2216
CATEGORIZATION	SPONTANEOUSLY COMBUSTIBLE	DANGEROUS SUBSTANCES

LIST OF APPROVED AOX BY IMDG

BHT
TOCOPHEROL

WOULD IT BE INTERESTING
TO EXPAND THIS LIST WITH
MORE OPTIONS?

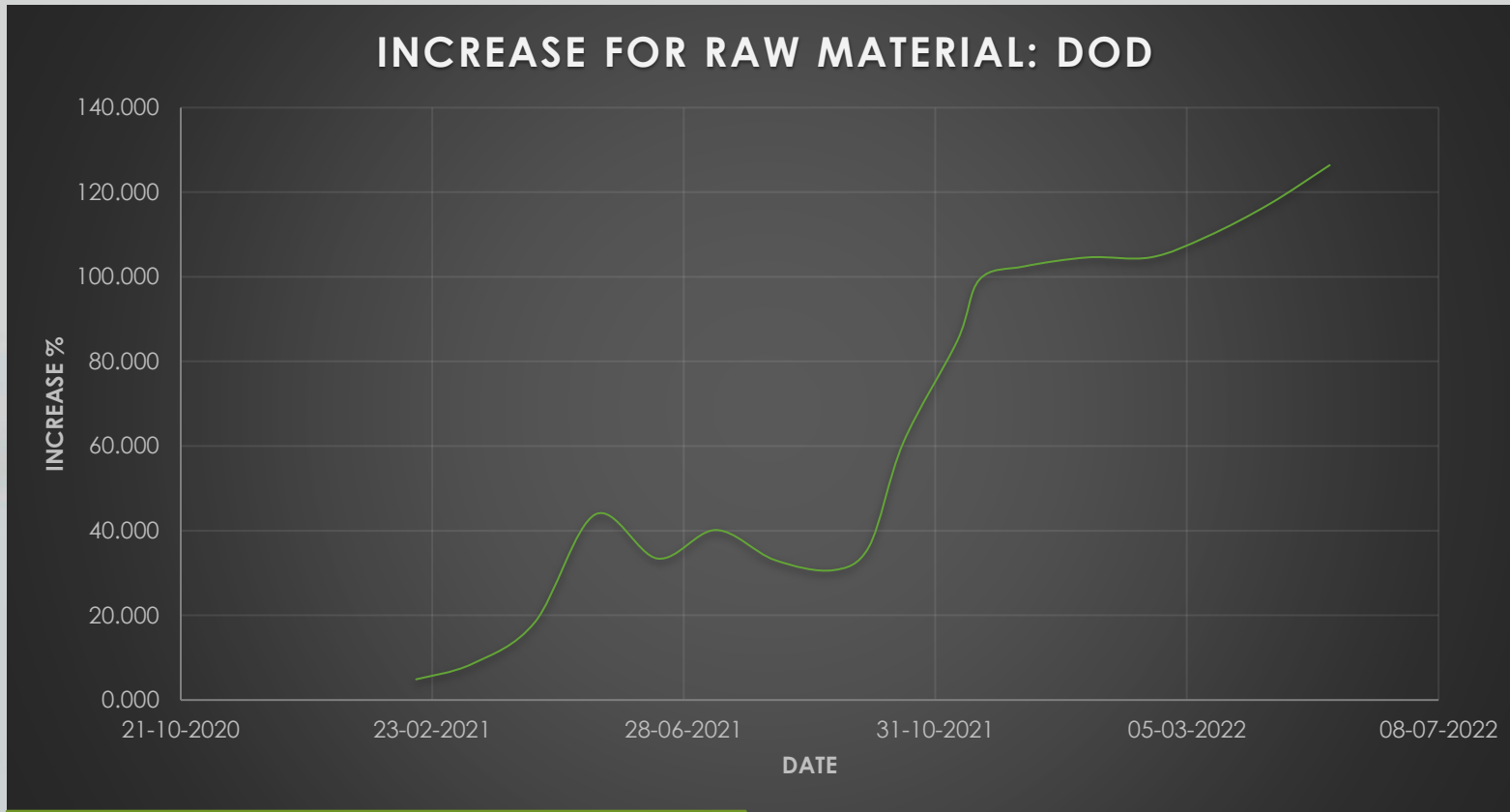


FACTORS AFFECT TO THE COMBUSTION

1. WEATHER AND SEA CONDITIONS
2. STOWAGE
3. TIME IN VESSEL
4. HEIGHT OF STOWAGE
5. VENTILATION SYSTEM IN VESSEL
6. PROCESS PRODUCTION
7. TYPE AND APLICATION OF THE ANTIOXIDANT

INDEX:

1. FISH OIL AND MEAL PRODUCTION
2. RESTRICTION FOR THE MARINE TRANSPORT
3. TOCOPHEROL MARKET SITUATION AND TENDENCY
4. OPTIONS AND STRATEGIES FOR THE STABLIZATION
5. CONCLUSIONS



DATA OBTAINED FROM TOCOPHEROL MANUFACTURERS

TRANSPORT COST
DELAY IN TRANSPORT
INCREASE OF DEMAND IN A SHORT
TIME

ENERGY COST



INDEX:

1. FISH OIL AND MEAL PRODUCTION
2. RESTRICTION FOR THE MARINE TRANSPORT
3. TOCOPHEROL MARKET SITUATION AND TENDENCY
4. **OPTIONS AND STRATEGIES FOR THE STABLIZATION**
5. CONCLUSIONS

OPTIONS FOR THE STABILIZATION AGAINST OXIDATION

➤ SYNTHETIC ANTIOXIDANTS:

➤ PROPOSALS WITH BHT OR ITS COMBINATIONS WITH BHA, PROPYL GALLATE

➤ BEBUTOX G-20 (BHT + CHELATING AGENT)

➤ BEBUTOX GP (BHT + PROPYL GALLATE+ CHELATING AGENT)

➤ ABUTOX CT (BHT + BHA + CITRIC ACID DERIVATIVE)

THE KNOWLEDGE IN HOW THE ANTIOXIDANTS WORK ALONG WITH THE RAW MATERIAL AND PROCESS ARE ESSENTIAL TO CONTROL THE OXIDATION OF FISH MEAL

OPTIONS FOR THE STABILIZATION AGAINST OXIDATION

➤ Natural antioxidants:

➤ Proposals with Tocopherol or its combinations with Natural extracts

➤ Naturnox-15 (Tocopherol) 200 ppm → 60 ppm

➤ Naturnox-10 (Tocopherol + Botanical Extract + Olive derivate) 200 ppm → 110 ppm

➤ Natox Prime (Tocopherol + Deodorized Rosemary extract+ Chelating agent)

➤ No Tocopherol: Green Tea + Rosemary

THE SYNERGIC EFFECT WITH THE DIFFERENT MOLECULES
ALLOW US THE MAXIMUM RESIDUAL OF TOCOPHEROL IN FISH
MEAL CUTTING DOWN ON THE TOCOPHEROL CONSUMPTION

INDEX:

1. FISH OIL AND MEAL PRODUCTION
2. RESTRICTION FOR THE MARINE TRANSPORT
3. TOCOPHEROL MARKET SITUATION AND TENDENCY
4. OPTIONS AND STRATEGIES FOR THE STABLIZATION
5. CONCLUSIONS

- IN TERMS OF OXIDATION, DIFFERENT FACTORS DEFINE THE STABILITY OF THE FISH MEAL.
- THE EXTENSION OF THE LIST OF ANTIOXIDANTS APPROVED BY IMDG GUARANTEES MORE RESOURCES TO STABILIZE PRICES IN THE MARKET
- TOCOPHEROL IS THE MOST KNOWN ANTIOXIDANT.
- RUNNING WITH SYNERGIC BLENDS BETWEEN DEODORIZED ROSEMARY EXTRACT AND TOCOPHEROL OFFERS DIFFERENT BENEFITS:
 - CUTTING DOWN ON THE TOCOPHEROL CONSUMPTION.
 - HIGHEST RESIDUAL OF TOCOPHEROL INTO THE MEAL.
 - REDUCING THE COST OF THE STABILIZATION



THANK YOU VERY MUCH INDEED

3A ANTIOXIDANTS

www.tres-a.net

info@tres-a.net

(+34) 968 839 004

