

# Sulphite Free with Prawn Fresh<sup>+</sup><sup>TM</sup>



# The industry challenge....



Sulphite Free

“Maintain seafood quality, extend shelf-life and reduce rejection levels”

*Excessive blackspot, poor looking or badly smelling shrimp are the main reason for product rejection !*



# Introducing Prawn Fresh<sup>+</sup>™



Sulphite Free

A liquid solution **sulphite free** designed to increase shelf life by suppressing the PPO enzyme responsible for blackspot/melanosis development.

From an operational perspective Prawn Fresh<sup>+</sup>™ is a simple, safe and easy to use treatment in contrast to sulphite-based products



**Prawn<sup>+</sup>**  
**Fresh**





# Advantages of PrawnFresh<sup>+</sup>™



Sulphite Free

## Sodium metabisulphite

- causative agent of allergic reactions
- danger to health/asthmatic people

## 4-Hexylresorcinol (4-HR)

- alternative antimelanotic products
- considers as Generally Recognised as Safe (GRAS)

## Prawnfresh (PF)

- 4-HR-commercial based product
- organic acids and salts, plant extracts and inorganic stabilising buffers



# Complete comparison



Sulphite Free

## Sodium Metabisulphite

- Corrosive when mixed
- Emits toxic SO<sub>2</sub> gas
- Hazardous in confined spaces
- Causes allergic reaction
- Irritates if sensitive to sulphur or asthmatic
- Mixed results
- Accounts for high rejection rate

## Prawn Fresh<sup>TM</sup>

- ✓ Non-corrosive
- ✓ Does not emit SO<sub>2</sub> gas
- ✓ Non-hazardous / non-toxic
- ✓ Non-allergenic
- ✓ Safe
- ✓ Consistent results
- ✓ Ready-mixed
- ✓ Less rejections, less waste



# Efficacy proven in multiple species



Sulphite Free



- A proven sulphite-free melanosis solution for all Penaeid shrimp species and Langoustines.
- Currently being used worldwide on fishing vessels, processing factories and shrimp farms with excellent results





# Testing done independently by academic collaborators



Sulphite Free



## Efficacy of Prawn Fresh<sup>+</sup>™

Evaluated by Glasgow University

Stirling University

Aberdeen University

**Seafish (UK government-body for the industry)**



# Dipping Prawn Fresh<sup>+</sup><sup>TM</sup>



Sulphite Free

## At grow out pond

- Use immediately after harvest at pond site
- Shrimp should be dipped in PF solution
- Use at the washing step after auction or grading



## At the processing plant

- Use at the chlorine purge step
- Replace all uses of Meta
- Use during defrost process
  - IQF
  - frozen bloc



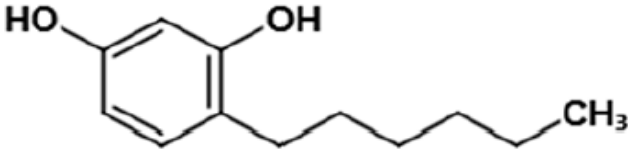


# Prawn Fresh<sup>+</sup>™ and 4-Hexylresorcinol (E586)



Sulphite Free

- 4-Hx is a substituted phenol that has antimicrobial activity
- 4-Hx is approved in many countries as safe or compliant with specific regulations. E.g.
  - E.U - Directive 2006/52,
  - U.S. - FDA GRAS Provision 21 CFR 182.1,
  - FSANZ- Standard 1.3.1 Code for food additives,
  - PR China –Food Standards Hygiene Standard (GB 2760-1996).

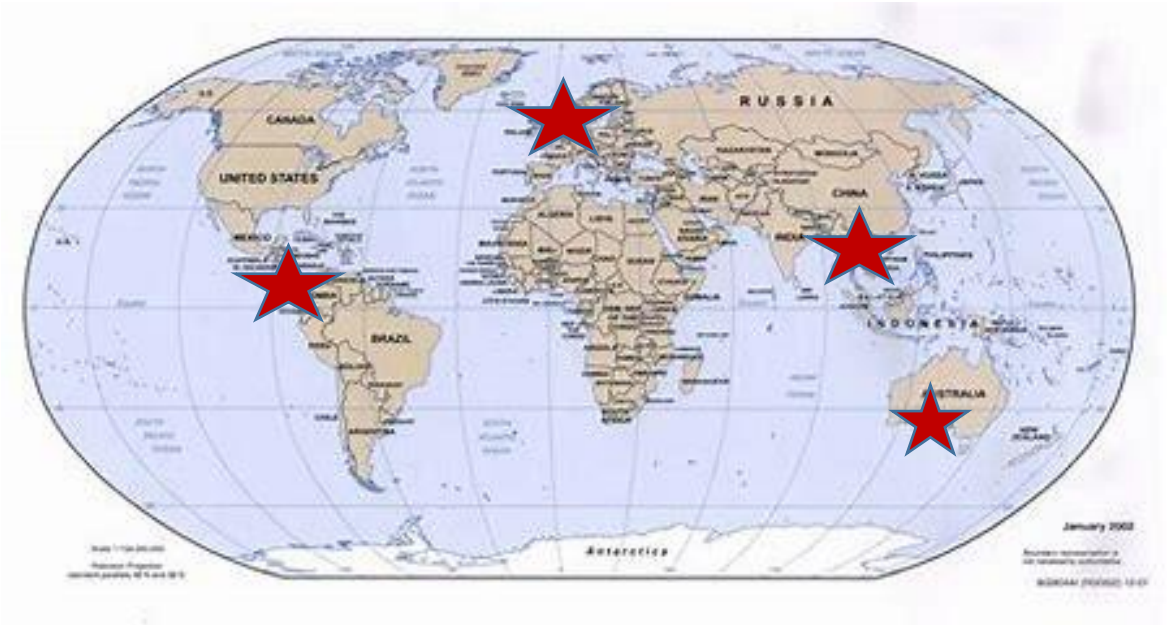
Chemical Structure	Physico-Chemical Properties [26]
	Molar mass 194.27 g/mol Melting point 62–67 °C Log $P_{o/w}$ 3.88
$P_{o/w}$ : octanol-water partition coefficient.	

# Current Markets



Sulphite Free

- Europe, UK
- Central and South America
- SE Asia, Australia



# What is melanosis and who is responsible?



Sulphite Free

- Melanosis is a non-infectious mechanism characterised by the gross accumulation of the black pigment melanin.
- The enzyme responsible for melanosis development is Phenoloxidase (PPO).
- When animals are alive PPO activity is a key defence mechanism to protect crustaceans from bacterial infection.



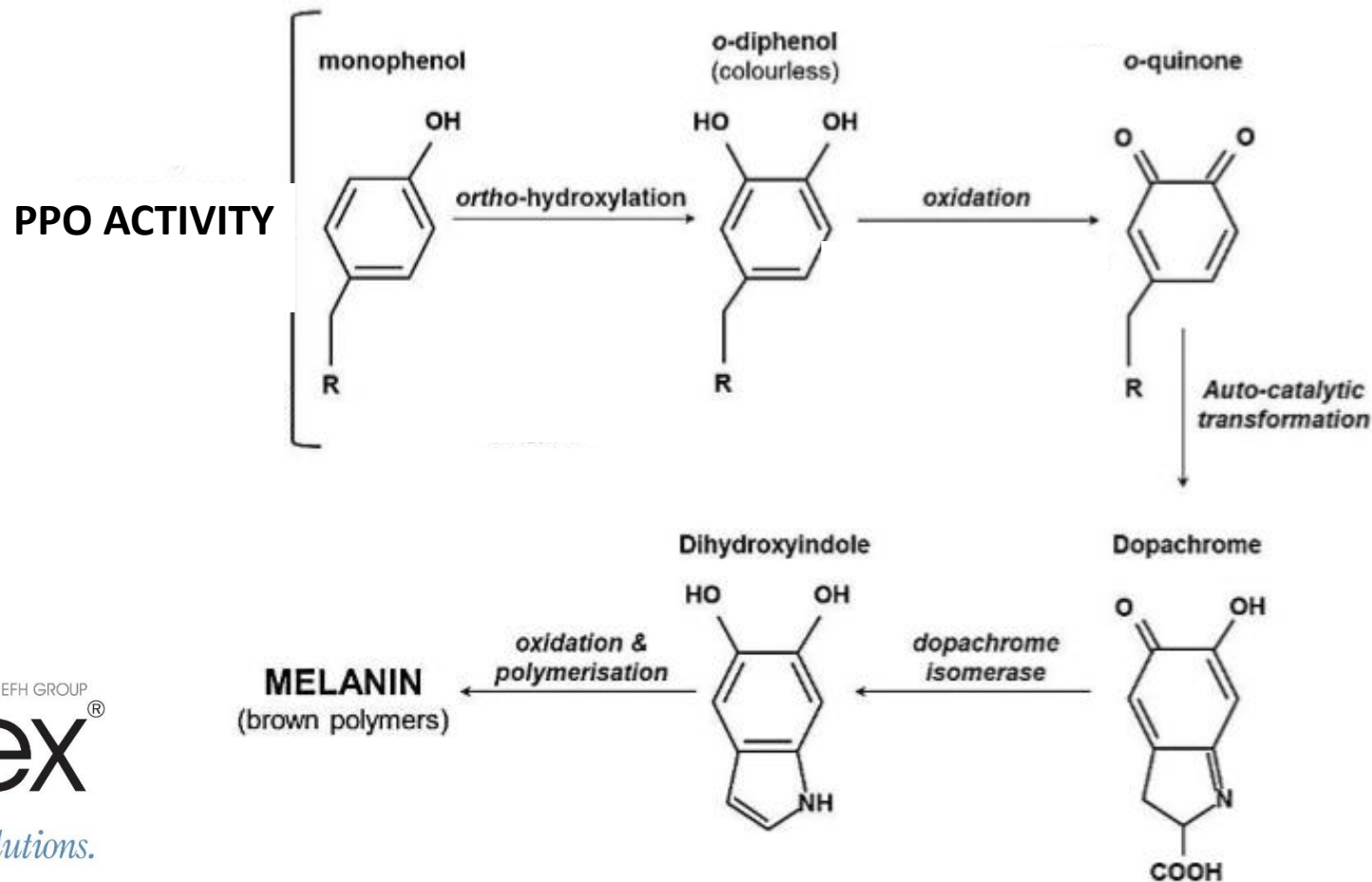


# What is melanosis and who is responsible?



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At post-harvest PPO activity starts at soon as animals are removed from the water environment.

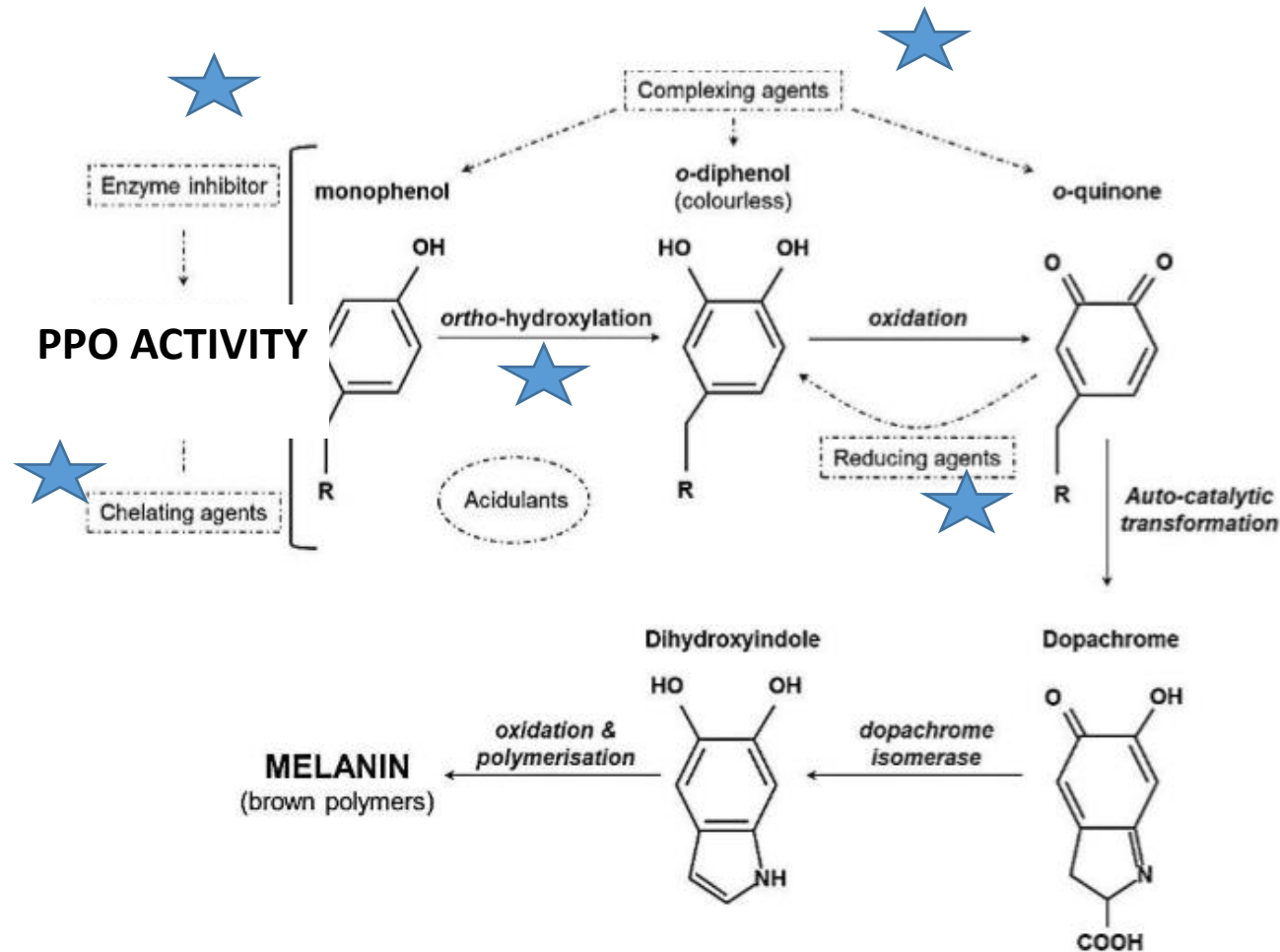


# How can the effects of melanosis be delayed?



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Different strategies to delay melanosis: PPO inhibitors, acidulants, chelating agents, complexing agents or reducing agents



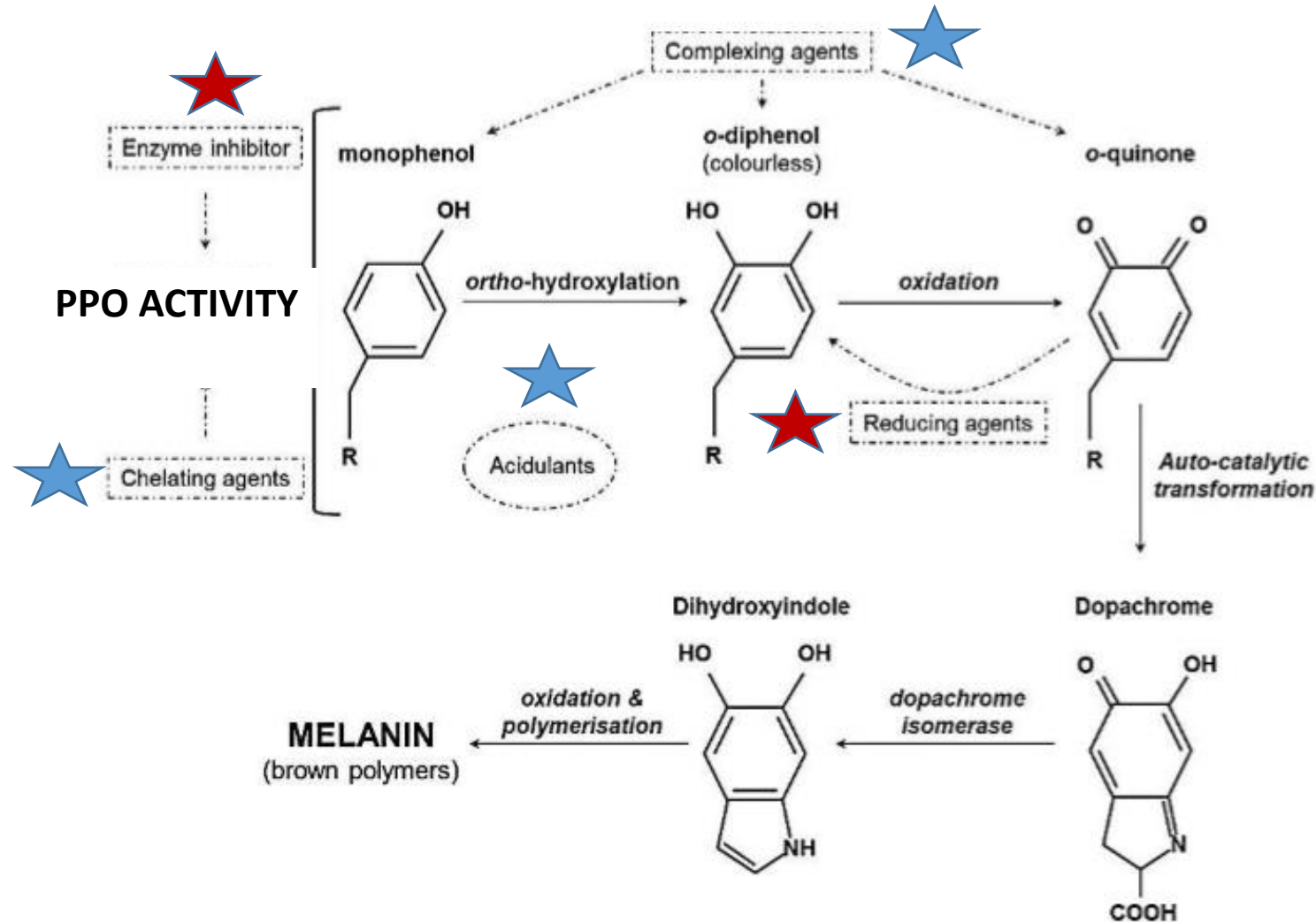
# How can the effects of melanosis be delayed?



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Prawn Fresh<sup>+</sup><sup>TM</sup> active ingredient is 4-hexylresorcinol (4-Hx), which is an inhibitor of the PPO enzyme.

4-hexylresorcinol  
is a PPO enzyme  
inhibitor



Sulphite-based  
treatments are  
reducing agents



# Regulatory Framework 4-Hexylresorcinol (4-Hx)



Sulphite Free

L 204/10

EN

Official Journal of the European Union

26.7.2006

**DIRECTIVE 2006/52/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
of 5 July 2006**

amending Directive 95/2/EC on food additives other than colours and sweeteners and Directive 94/35/EC on sweeteners for use in foodstuffs

(19) In accordance with a request from a Member State and the opinion of the Scientific Committee on Food of 5 March 2003, 4-hexylresorcinol, which was authorised at national level under Directive 89/107/EEC, should be authorised at Community level.

(iii) the following row is added:

'E 586	4-Hexylresorcinol	Fresh, frozen and deep-frozen crustaceans	2 mg/kg as residues in crustacean meat';
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# Residue levels 4-Hexylresorcinol (4-Hx) in our dipped products



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DATOS DE LA MUESTRA						
Tip de muestra	Camarón co'a	Cantidad	Aprox 2 Kg			
No. de muestras	1 (n= 1)	Lote	504			
Presentación	Ca a de camión	Fecha de recepción	05 de Julio del 2017			
Toma de muestra	Realizado por el Cliente	Fecha toma de muestra	N.A.			
CONDICIONES DEL ANALISIS						
Temperatura (°C)	21.7	Humedad (%)	61.5			
Fecha de inicio de Análisis	12 de Julio del 2017					
Fecha de Finalización del análisis	12 de Julio del 2017					
RESULTADOS						
CODIGO CLIENTE	CODIGO UBA	PARAMETROS	METODO	RESULTADOS	Unidad	Límite Detección (ppm)
MUESTRA # 1 LOTE 804 5186 28-06-11	UBA-1915-1	4-Hexil Resorcinol	Nezato et al., 2005 (HPLC-UV)	0.78		
Observaciones:						
1. Los resultados emitidos en este informe corresponden únicamente a la(s) muestra(s) recibidas por el laboratorio. No siendo extensivo a cualquier lote. 2. Este reporte no debe ser reproducido parcial o totalmente, excepto con la aprobación escrita por parte del laboratorio. 3. Nomenclatura: Y.D. = No Detectable, N.A. = No aplica						
 Jean Carlos Vera Santos Jefe de Laboratorio			 Nelson Montoya P. M. Sc. Gerente General & Técnico R.P. 1115			



# Comment from Captain Brine Shrimp Freezer Boat Florida<sup>TM</sup>



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- Prawnfresh Plus will become a game changer for the domestic Gulf Shrimp industry. It dramatically reduces black spot, improves the appearance and extends retail shelf-life for fresh, shell-on shrimp up to seven days when the shrimp is properly refrigerated.”
- After five days on ice in a refrigerated display case, the shrimp were still “shiny, clear and looked like they had just come out of the sea”.
- Reid also expressed another unexpected positive benefit that shrimp freezer boat captains have found. Normally freezer boats must flush and recharge their brine tanks regularly while at sea. That process requires them to flush the brine tank and replace the seventeen 36kg bags of salt that are used in the brining process at a cost of \$10 per bag. But when they soak shrimp in Prawnfresh prior to putting it in the brine tank, the quality of the water is extended for longer periods and does not require them to recharge the system as often.





# What our skippers say...

TM



**Sulphite Free**

*I have been using Prawnfresh for over 3 years now, since the change our Prawns have looked a lot brighter and we have seen a 7% increase in yield. Prawnfresh more than pays for itself, its user friendly and doesn't do any damage to our dipping tank. All in all its a very good product to use. Our Prawn Processor - Fraserburgh Seafood have also changed to Prawnfresh.*

**David McRobbie. Skipper "Karen Ann FR559".**

*"I had been using Meta for some time and heard of Prawnfresh about a year ago and I am really glad I made the change. The staff who apply it really prefer this to meta and so do buyers when they see the prawns. "*

**Stephen West – Skipper. "Daystar BF151"**



**Sulphite Free**

# What EU Processors Say...

We use "Prawnfresh" for treating Norway lobster. We have changed from using Sodium Metabisulphite E223 to "Prawnfresh" E586. Tests have shown that the Norway lobster treated with Prawnfresh" stays nicer in colour, texture and odour, longer than raw material treated with the E223.

Furthermore with Prawnfresh our production equipment is no longer exposed to the corrosive properties of E223. This keeps costs down. We also feel that "Prawnfresh" is a healthier additive for the consumer, than the one we used before.

Also our employees used to have general breathing problems including irritated eyes and nose. This is no longer an issue after changing to Prawnfresh.



**Donald Kristensen**  
**Managing Director**



# Sulphite Free Seafood with Prawn Fresh<sup>TM</sup>



Sulphite Free

- Open new Markets by marketing “ **Sulphite Free Produce**” !
- **Prawn Fresh** treated seafood is superior quality and has an outstanding appearance compared to Sulphite Treated !
- Consumers who previously avoided seafood will be stimulated to buy !
- **BE AHEAD OF THE GAME** , market trends point to increased population moving away from the use of Sulphites !

