

Sorting mussels at Pesquera El Golfo's processing plant in Chonchi which has just been commissioned and is producing three different frozen mussel products



Chile builds more plants

As pelagic fishing decreased significantly in the Pacific Ocean off Chile's 5000 plus km coastline, all the big players in the country's fishing industry began to look to aquaculture to maintain their businesses.

Two species are mainly farmed in Chile: salmon (both Atlantic and Pacific species) and blue mussels (*Mytilus chilensis*). These are augmented by many other fish and shellfish species including turbot, king crab, clams, pink abalone, hibrane, octopus and oysters.

The first fishing company to diversify into aquaculture was one of Chile's best known and traditional fisheries companies Pesquera San José, which has a 67% share of the canned jack mackerel domestic market and which exports its products to 65 countries. It is one of the country's largest seafood exporters.

Chile's incredible mussel farming boom has caused a massive building of giant state-of-the-art processing plants, as **Peter J Neilson reports**

Agustín Grez, San José's regional manager for the Tenth (X) Region, tells *Seafood Processor*: 'Our company was the first fishing enterprise to diversify into aquaculture. Twelve years ago we began farming scallops in Tongoy Bay in the Fourth Region and now we are Chile's No 1 scallop exporter.'

'After this, we began to farm baby clams – vognole – for the Italian market and have been very successful in this venture. But when we noticed that the European market was lacking

a constant supply of mussels, and that Spanish mussel processors were setting up on-growing sites and processing plants in Chiloé and Puerto Montt, we also decided to become part of this booming industry, being the first Chilean fishing company to do so.

'Our expertise in scallop and clam farming was certainly an asset, and as soon as we obtained around 300 hectares of sea concessions in the Calbuco area (close to Puerto Montt) and in Yal Bay (Chiloé Island) we built our mussel and abalone hatchery in

Teupa and began to develop our mussel production program,' he explains.

'The next step was the building of our 10,100 square metre state-of-the-art processing plant, which began to process mussels on January 9. Located in Chiquihue – 13km from Puerto Montt – this modern plant has three mussel processing lines for: whole-shell 'juicy' vacuum-packed mussels, half-shell frozen mussels and IQF mussel meats.

'All our processing lines are manufactured by Dutch company Franken BV – considered the best in the world – and at this moment we are processing 10 tonnes per hour of IQF frozen mussel meats.'

Swedish company IQF Frost has installed two OctoFrost model 5/2 at Pesquera San José's plant in Chiquihue. 'With this new fluidized bed freezer, Pesquera San José [PSJ], ▶

CHILE

◀ is freezing cooked IQF mussel meats with a very good quality,' says IQF Frost's Pär Björkman.

According to Björkman, the OctoFrost offers a unique transportation system based on a removable plastic bedplate instead of a mesh belt. 'Through the unique control of transportation and airflow, blocks and crumble of delicate seafood is close to zero. The interior design and removable bedplates also offers excellent cleanability of the machine.

'By installing two machines beside each other Pesquera San José can reach a double capacity, but also continuous production as you can defrost one freezer at time. Two OctoFrost normally occupy less floor space than one traditional belt freezer.'

According to Grez: 'Our four mussel on-growing sites in Calbuco and two in Chiloé supply us with sixty per cent of our needs – which are 28,000 tonnes of mussels a year – and the remaining forty per cent is supplied by local "small" mussel farmers.

'Our country's mussel exports are fulfilling the needs of the world markets – mainly Spain and Italy – and in 2006 we exported 27,152 tonnes of mussels, a significant increase over the 18,785 tonnes exported in 2005,' he says.

'In terms of revenues, 2005's \$40.5 million earned by our mussels was dwarfed by 2006's \$64.7 million, a massive sixty per cent increase in only one year, which goes to show how Chile's mussel industry is growing steadily and how we, as a top mussel processing company, are keeping up with this trend.'

It is no secret that Chile is one of the

Fishing industry in decline

ENVIRONMENTAL activist Juan Carlos Cárdenas explains why he thinks the Chilean fishing industry is in decline.

'The main problem is that the government does not take any action against the large factory trawlers belonging to the Eastern Block which are preying on all the fishing stocks in the Pacific Ocean, just outside Chile's EEZ.

'In fact, taking advantage of darkness at night, they dart into our jurisdictional waters and reap our ocean with their trawl nets, and then return to international waters at dawn before the Chilean Navy patrol aircraft arrive on the scene.

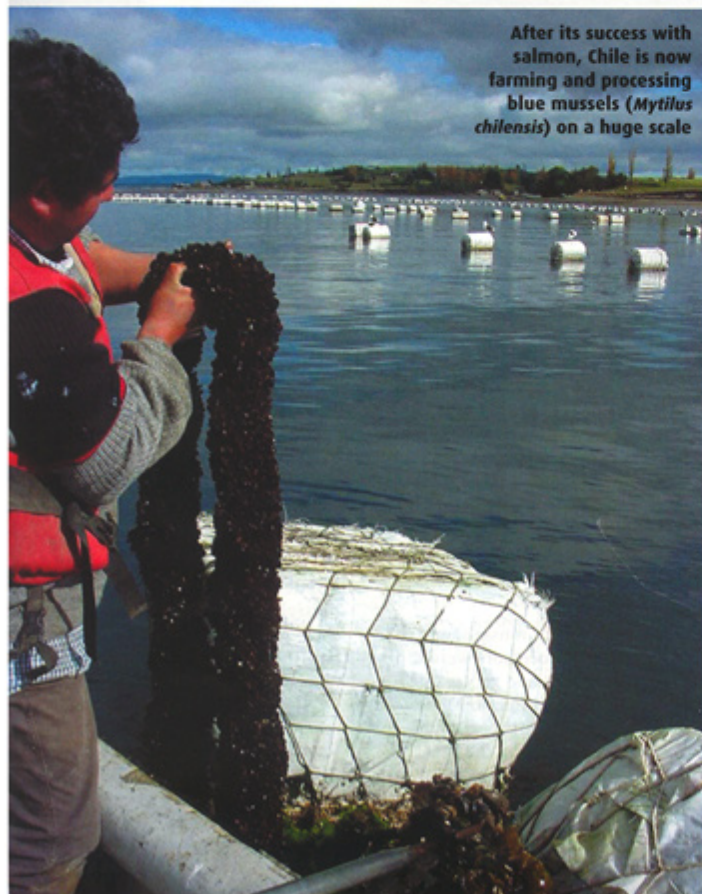
'Hopefully we will soon have a more effective regulation which will protect all fishing stocks in the South Pacific Ocean once the United Nations suggestions are developed into a multi-national agreement for protecting the ocean and all living creatures which dwell there.

'At this moment, representatives from 22 nations are in session in Valparaíso, so we should soon have a very positive result and our fishing stocks will be able to reproduce themselves unhindered.'

world's top salmon producers, and Pesquera San José could not be absent from this booming industry.

Therefore, at the end of 2006, the company decided to become another player in this very lucrative business and together with Inversiones Santa

El Golfo's traditional Talcahuano processing plant. In addition to salmon and mussels, the company has also betted heavily on producing fillets from wild-caught fish for export



After its success with salmon, Chile is now farming and processing blue mussels (*Mytilus chilensis*) on a huge scale

Cruz formed Chile's newest salmon producer, Salmones Humboldt. Pesquera San José owns 60% of this new company and its salmon will be processed in its brand new processing plant in Chiquihue, where it has just started to process mussels.

San José's salmon will all be processed as canned product which will satisfy the needs of its demanding customers, mainly in the US and Europe.

Another top player

PESQUERA El Golfo is another top player in Chile's booming mussel

industry. A traditional fishing company like Pesquera San José, Pesquera El Golfo also looked to aquaculture when pelagic fishing stocks began to dwindle in Chile's EEZ (exclusive economic zone), and its obvious decision was to start farming mussels.

The company has just commissioned a modern mussel processing plant with Spanish manufactured Technofish lines in Chonchi, close to Castro, Chiloé Island's capital city, and is now processing three different lines: full-shell 'juicy' vacuum-sealed mussels, half-shell frozen mussels and IQF frozen mussel meats.

Chile's top mussel exporters, 2006

Company	US\$ FOB
Cultivos Toralla SA	11,116,026
Conservas y Cultivos de Puerto Montt SA	5,137,353
Conservas y Congelados del Pacifico	4,714,863
Agromar Ltda	4,138,33
Bajamar Ltda	3,525,669
Soc Comercial Ria Austral Ltda	3,172,539
Soc Comercial Pacifico Austral Ltda	2,262,766
Pacific Gold SA	1,877,410
Exportadora Mytilus SA	1,557,326
Cultivos Marinos del Pacifico SA	1,540,245
Granja Marina Chasquear SA	1,284,040
Congelados del Sur SA	1,244,992
St. Andrews Smoky Delicacies SA	1,027,584
Integra Chile SA	1,008,589
Pesquera Transantartic SA (Robinson Crusoe)	808,259



El Golfo's marketing and sales manager, Eduardo Goycoolea, tells *Seafood Processor*: 'Chile's mussel industry's current situation is very promising and has a very important future.'

'Our mussel industry has clearly evidenced a massive growth, mainly caused by three factors: the installation of many Spanish mussel processing companies in Chiloé; the dwindling pelagic fisheries which has forced large fishing companies like us to search for other horizons, aquaculture being the most viable prospect and mussel farming the best option; and Chile having the purest waters on Earth, which makes our blue mussel the best quality product on the worldwide market.'

Goycoolea goes on to say: 'Our main markets are in Europe, our main customers being Spain, Italy, Holland, France and Germany. Nevertheless we have developed very good business relations with the United States, Asia and Latin America.'

'When we realized that mussels were a top product and that the world market for this product did not have an adequate supply, we decided to enter the game. We bought a former salmon processing plant in Chonchi, on Chiloé Island, and transformed it into a state-of-the-art mussel processing plant, with the best available machinery.'

'Our company is completely vertically integrated and we can assure

our customers of our product's absolute traceability. A greater part of our products are exported, but we also have an important share of the domestic seafood market.'

'As for over production in the mussel area, I can assure you that

there will not be over production. The world market's demand is far superior to [greater than] current supply and this has been crucial in obtaining excellent prices for our mussels.'

Therefore, we are optimistic in this aspect and I can assure you that Chile's

mussel industry will continue to expand at the current rate, which is about thirty per cent per year.

'Our blue mussel is a delicious product, and our quality and health standards are far superior to what the market currently demands, so we have no doubt at all regarding the increase of our sales on the world market.'

'This was evidenced at our booth in the European Seafood Exhibition in Brussels last month [April], where the amount of visitors we had was far superior to our expectations,' Goycoolea ends.

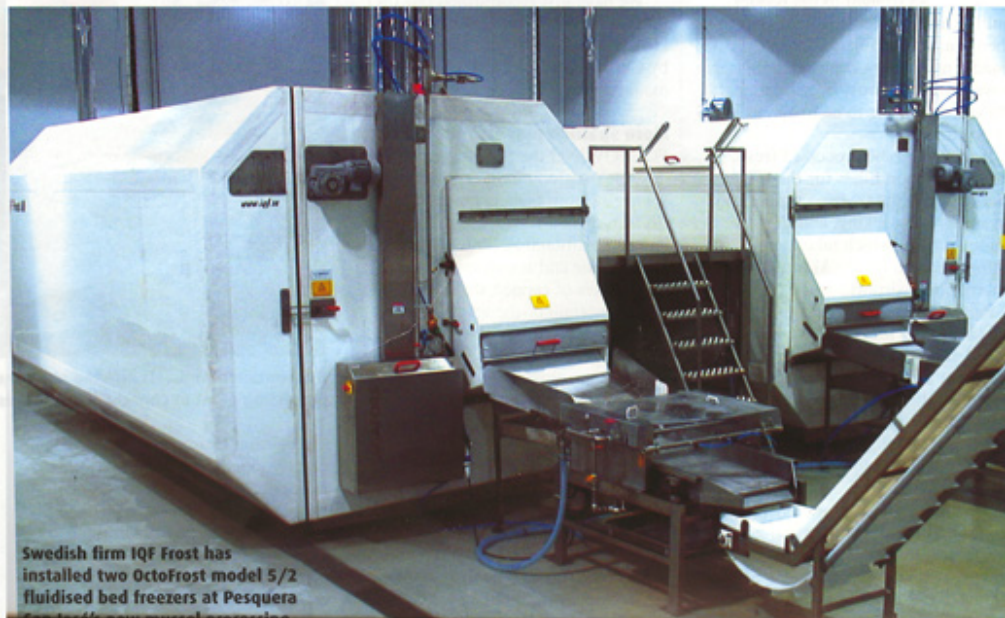
Surimi and hake

HOWEVER, Pesquera El Golfo is not only a salmon and mussel farming giant. Added to the fact that 60% of the company's production goes into fishmeal with two large factories – in Talcahuano and Valdivia – its seafood oriented company is also Chile's largest surimi manufacturer, and has also betted heavily on producing frozen Pacific pomfret, hake and hoki fillets for export.

The surimi is produced in a spotless and environmentally friendly modern processing plant in Talcahuano, while hake and hoki are processed in the traditional Talcahuano plant where the company's salmon will also be processed.

Nicos Nicolaidis, El Golfo's operations manager, tells *Seafood Processor*: 'The great decrease in hake and jack mackerel landings forced us to reduce the size of our hake and hoki processing plant; nevertheless the space left by this reduction will be occupied by our salmon processing lines so our traditional factory will remain one hundred per cent operative.'

Alberto Romero, Pesquera El Golfo's CEO and general manager, adds: 'In our 20 years of existence we have constantly improved our production. It is sad to see how the reduction of TACs [total allowable catches] by the government has forced us to reduce our fishing fleet from twenty vessels to only ten. ▶



Swedish firm IQF Frost has installed two OctoFrost model 5/2 fluidised bed freezers at Pesquera

◀ 'In fact, some of our perfectly useful vessels are now lying mothballed in the Valdivia fishing vessel graveyard. It is clear that aquaculture is our best bet. Here, in our Talcahuano plant, we can observe that the size of the hake landed by our vessels is only half of what we traditionally processed as frozen fillets a few years ago.'

'Giant Chinese, Polish, Korean, Japanese and Cuban factory trawlers lingering just outside our EEZ are preying the jack mackerel, hake and hoki stocks, hindering the reproduction cycle of these species. We see this here in our factory. The hake landed by our vessels used to be fifty to sixty centimetres in length and now they are much smaller. In fact, some are so small that they cannot be skinned or filleted so we have to send them to our fishmeal plant.'

Most modern salmon processing plant

BY far South America's most modern salmon processing plant, Pesquera Los Fiordos' giant factory located in Quellón, on the southern tip of Chiloé Island has just added another processing line to the formerly existing two, so it now has three salmon filleting lines.

Pesquera Los Fiordos is the only salmon processing plant in Chile which processes the fish before rigor mortis sets in. The salmon and trout are extremely fresh and the company does not use bins as the salmon and trout are pumped directly to the chilling and stunning area of the processing plant.

It has two holding pens in the sea just in front of the plant where salmon and trout are pumped from the wellboats which bring the fish from the XI Region farms. From here, according to the company's needs, the fish are again pumped – this time into the plant – via salmon duct pipelines which go straight from the pens to the plant's chillers.

Once bled and through Danish Linco machines – for chilling and stunning – the fish head straight to the Baader gutting machines on the line. They are then headed and filleted – also by Baader machines – continuing their trip towards the Starfrost freezing tunnel if the end product is to be frozen as H&G or portions.

If they are to be processed fresh, Atlantic salmon fillets for the US market avoid the freezing tunnel and go straight to packing, and then to waiting lorries which take them immediately to Puerto Montt international airport.

Patricio Mena, the plant's manager, tells *Seafood Processor*: 'We have just added another salmon filleting line to our plant and now process 70,000 headed and gutted rainbow trout and coho salmon a day – with an average weight of 2.8 kilos per fish.'

'The Atlantic salmon filleting line, on the other hand, processes 225 tonnes of 4.5 kilo fish per day [50,000 fish], of which a small portion goes to the domestic market [supermarkets] and the remainder mainly goes to the United States market.'

'Los Fiordos has just commissioned a state-of-the-art hatchery up in the Andes mountains in Region IX, and in



Trimming salmon fillets at Pesquera Los Fiordos' giant modern processing plant in Quellón. The company has just installed a third filleting line

September will also commission a modern feed plant on the road to Chiloé, thus becoming a fully-integrated company.

'We have just reconfirmed our ISO 9001, ISO 14001 and ISO 18001 and HACCP certificates, through an audit by German certifiers DSO,' general manager Sady Delgado comments.

More Spanish players join the pack

FOLLOWING the Spanish expansion in Chile's seafood industry, Jealsa Rianxeira from Galicia bought Chilean-owned Pesquera Transantártica and its traditional Robinson Crusoe brand name and is currently producing 3000 boxes of canned shellfish a day.

Its new state-of-the-art processing plant in Chiquihue – close to Puerto Montt – processes mussels, clams, razor clams, pink clams and many other bivalves.

Director of Operations Guillermo Mariño de Oya tells *Seafood Processor*: 'Our brand-new shellfish processing plant in Chiquihue was commissioned in December 2006 and is now fully operative. It occupies over 6000 square metres and employs 400 workers in two shifts.'

The impressive building has five 30,000 litre stainless steel tanks which hold a 150,000 litre supply of vegetable oil for its canned mussels in oil.



A mountain of mussels arriving at Pesquera El Golfo's recently commissioned processing plant at Chonchi, close to Castro, Chiloé Island's capital city

Robinson Crusoe canned shellfish are eagerly sought by US and European delicatessen stores because of their excellent quality, the company says.

Spanish entrepreneurs Enrique Ferrando and Aquilino Suárez, joint owners of newly-formed mussel company F & S, recently built an impressive 8000sq m state-of-the-art mussel processing plant in Chonchi, on Chiloé Island.

'Our new mussel processing plant is the only one in the Tenth Region certified in category "A",' general manager Aquilino Suárez tells *Seafood Processor*.

Ferrando and Suárez have been friends for many years. Aquilino Suárez was manager of one of Enrique Ferrando's businesses in Spain and also had the concession of a mussel bank which was totally ruined by the oil spill caused by the grounding of



British oil tanker *Prestige*.

'After this, we became partners, and Aquilino immediately travelled to Chile and began developing our mussel processing project,' comments Enrique Ferrando, executive chairman of F & S.

'We invested \$13.3 million in sea farms and in building our ultra-modern processing plant, which we have just commissioned,' he explains.

At the beginning of 2007, the partners were approached by the Italian multi-national seafood giant PanaPesca, which acquired 25% of their stock and thus a new company – F & S Chile – was formed.

Ferrando says: 'The Italian company will provide their vast marketing expertise in worldwide distribution of seafood products. Already in Latin America they own four processing plants in Argentina, a commercial office in Montevideo [Uruguay] and another one in Boston [US], plus two offices in Europe, four factories in Africa and two in Asia.'

He goes on to tell *Seafood Processor*: 'This year we plan to export mussels worth \$10 million and will progressively increase our shipments by around 20% a year.'

Spanish mussel grower Cultivos Toralla SA, owned by the Leiro family, was a very successful player in the EU scene, but after the *Prestige* oil spill

and the poisonous algal bloom red tides, it immediately began to look abroad for better waters.

In fact, it was the first Spanish mussel company to begin operations in Chile. It did so well that, in 2006, it was Chile's No 1 mussel exporter, with

revenues in excess of \$11 million, more than double its nearest competitor, Conservas y Congelados de Puerto Montt SA, which exported products worth \$5.1 million.

General manager Sergio Leiro tells *Seafood Processor*: 'Chile's mussel industry is growing fast and uses the best technology available on the world market.'

'This is why Chile's international mussel exhibition, Expomytilus, takes place every year in Castro, Chiloé Island's capital city, because development of new machinery and technology advances in leaps and bounds. This show is a great asset for us because we must keep completely updated in technology in order to remain competitive,' he comments.

'There has been a great boom in this industry, but next year the sector's expansion will be stabilised. As for markets, this year prices have been quite low and the US dollar exchange rate has affected our production costs, but we foresee that the price of mussels will slowly recover.'

'We are a completely vertically-integrated company and have been in Chile for six years now boasting the fact that we are the country's No 1 mussel exporter.'

Diversified into mussels

ONE of Chile's fastest-expanding seafood producers – a long-standing salmon producer in southern Chile – decided to follow the steps of many other large Chilean seafood producers and diversified into mussel production, creating a new subsidiary Mytilus Multiexport.

General manager Arturo Clément tells *Seafood Processor*: 'This is the result of our constant search for new alternatives in seafood farming – which began in 2003 – and which will allow us to offer the worldwide market top competitive products,' he explains.

Multiexport's impressive 8000 plus sq m salmon and trout processing plant in Puerto Montt's industrial Cardonal sector will, in the near future, have a sister plant in Dalcahue, on Chiloé Island, which will exclusively process

Chilean blue mussels, Clément says.

Alejandro Floraz, general manager of the company's mussel division, comments: 'The mussel industry has developed significantly over the last six years. After the salmon industry, no other aquaculture venture has grown so fast as mussel farming.'

'Multiexport looked upon this species as another interesting market for diversifying our operations and decided to enter the business.'

'The potential in this area is great and we have the infrastructure our company created when it began salmon farming and processing twenty years ago, which is a strong backing for our entering the mussel processing industry.'

Another of the well established and traditional fishing companies which also diversified into processing shellfish and then ventured into aquaculture, is Pesquera Camanchaca.

A long time scallop grower and processor, the company began farming blue mussels in Chiloé. In 2006, it completed its new mussel processing plant near the town of Chonchi, on Chiloé Island 20km south of capital city Castro.

Its largest plants are in the north of the country, and also in Chile's VIII Region, in Talcahuano. All its plants have full export certification: HACCP, FDA (US); SLSI (Sri Lanka); EU; SENASA (Argentina); DIPOA (Brazil) and Chile's SERNAP certification; and are certified Halal and Kosher.

Many of its products – mussels, pilchards and jack mackerel – are canned:

Natural: Prepared in brine with a salt content of 3.5%, they are cooked in a direct steam cooker at 98 deg C for 30 minutes, after which the brine is added and the cans are sealed hermetically. Finally, the cans are heated to 116 deg C to assure sterility and a shelf-life of four years.

In oil: This product is also basically prepared in a 3.5% brine solution with added vegetable oil and is also cooked at 98 deg C and sterilised at 116 deg C.

In tomato sauce: The main ingredient which accompanies the seafood is a ▶

