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Argentine technology and innovation



Fish production



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Editorial



In this publication we present our technical capabilities for the development of fish species processing, whether marine or freshwater, both from sea, river and lagoon catches, and from fish farming through aquaculture development.

At INTI - Mar del Plata we have teams of professionals, testing laboratories and pilot plants to assist companies in the development of new products, according to market trends and consumer needs, the design of technological processes for the processing of raw materials by adding value to production.

The technology available in the pilot plant is used to design and produce the food products developed and to select and perform the technological processes that, starting from the raw fishery materials or fish farming development, result in new products that are placed on the market, providing nutritional quality and benefits for the human organism.

The infrastructure and equipment of the physicochemical and microbiological testing laboratories make it possible to evaluate the quality of raw materials and products during their shelf life. Likewise, determinations are made for nutritional labelling, verification of compliance with regulatory requirements and verification of safety.

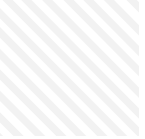
In the particular case of products developed with heat treatment technology, we assist the industry in the determination of heat penetration curves in canned products and temperature distribution in autoclaves and cookers, parameters required by SENASA - National Agri-Food Health and Quality Service in Argentina-for the registration of products destined to the market.

We support the development of the aquaculture sector by participating in the National Technical Advisory Commission for Aquaculture and in the Aquaculture Forum, and in the Food Cluster of Mar del Plata and surroundings, in which companies that process fish species participate.

The development and innovation in products and processing technologies, quality, productivity and sustainability as an engine for competitive positioning in new domestic and international markets, is the strategic key of INTI for the growth of the fishing and aquaculture sector.

Guillermo Carrizo

OPERATIONAL ASSISTANT MANAGER - PAMPEAN REGION- INTI



Puerto las Palmas S.A.



Pacu fish for export



Aquaculture, or breeding of aquatic organisms such as fish, shellfish and plants, has gained importance in world food production. In Argentina, this sector not only promotes protein-rich foods, but has become a fundamental pillar for economic development, employment generation and food security.

In particular, the cultivation of pacu, a species of great importance for national aquaculture, has gained worldwide recognition due to its lean, delicious meat and rapid growth.

It is worth noting that **the rotation between rice and pacu farming is a virtuous process that generates synergy between both activities**. This innovative practice, implemented by Puerto Las Palmas, promotes environmental sustainability and avoids the use of antibiotics in fish, since they grow in a natural environment without overcrowding. In turn, the pacu, as mentioned above, **contributes to enriching the environment for rice cultivation, creating this virtuous circle that benefits both species**.

The symbiotic relationship between the two not only highlights the importance of aquaculture in Argentina, but also represents an exemplary global model for sustainable food production.



According to official data, by 2022 the production of pacu (around 1,500 MT per year) will be entirely sold in the domestic market.

Source: Former Ministry of Agriculture, Livestock and Fisheries.

“Our rotation scheme makes us unique in the Latin American region. We work with low aquaculture density in ponds of 20 to 40 hectares with a maximum of 2,000 pacu units in each one. At the end of the year, the pacu reach their slaughter weight of one and a half kilograms per unit, leaving a clean and fertilized pond for rice cultivation.

This farming system is what differentiates us from traditional aquaculture”, explains Martín Meichtry, the company’s manager. Puerto las Palmas has a history of more than 50 years in the cultivation and marketing of fine long white and brown rice, packaged or in bulk.

The pacu is slaughtered in its slaughterhouse authorized by SENASA (National Agri-Food Health and Quality Service in Argentina), for export the same day it is caught. It is presented frozen in the following formats:

- **Whole, boneless fillet** of 6 to 9 ounces, in boxes with two heat-sealed packages of five pounds each.
- **Slices of boneless loin**, packed in 1 pound heat-sealed packages.
- **Canned** in 120gr. cans in oil, pacu broth and in water with brine.

Marisa Villian, a member of the Process Technology and Pampean Services Department of the National Institute of Industrial Technology (INTI), explains that the company was contacted to develop a canned pacu preserve from a by-product generated by loin deboning. Although this cut is very tasty, due to its large amount of bones, it does not demand direct consumption.

That is why this piece was subjected to autoclave heat treatment so that the bones are imperceptible, maintaining the flavor and texture characteristic of this tasty species. This resulted in a product that does not require refrigeration, extending its shelf life and facilitating storage and transportation.



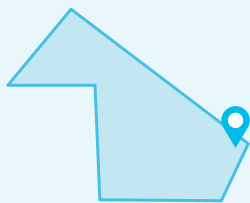


Finally, the development of this canned product was transferred to 120 g cans in three variants: oil, pacu broth and brine.

Martín Meichtry, comments that they are the only ones in the region to develop, together with INTI, a gourmet canning of pacu, thus not only revaluing a by-product in a new production line, but also generating a new quality, delicious and excellent offer.

Currently, the company is about to export its first pacu to the United States. Its rice has been present in Latin American countries for decades and, knowing the important demand both in Central America and Europe, it considers it interesting to target these new markets.

“Normally in rice cultivation agrochemicals are used to control weeds and plagues, we are the only company in the Latin American region that has achieved an environmentally responsible and sustainable production through the rotation of rice cultivation with pacu. We are making progress in transforming our entire rice production under this model, which allows us to provide peace of mind that our products are healthy. **At the same time, we are the first Argentine company to make our pacu known to the world**”, Meichtry concludes.



Puerto las Palmas S.A.

Puerto las Palmas, Chaco

Rice and pacu farming

- Pacu processing plant: 500m²
- Rice processing plant: 2,500 m² (2,500 m²)
- Annual production capacity: pacu: 800 tons and rice: 30,000 tons

• HS CODE (NCM):

- 1006.20.20 / Brown rice
- 1006.30.00 / Semi-milled or wholly milled rice, whether or not polished or glazed
- 0303.89.63.100H / Pacu (*piaractus mesopotamicus*), canned, frozen. Whole. Packages of a net content not exceeding 1 kg.
- 0303.89.63.900B / Pacu (*piaractus mesopotamicus*), packed, frozen. Whole. Other.
- 0304.89.90.500E / Pacu (*piaractus mesopotamicus*), canned, frozen. Filleted.



MANILA S.A.



Trout raised in a natural environment: the Alicura reservoir



INTI (National Institute of Industrial Technology) has more than half a century of experience in assisting the fish farming industry through technical services, developments and tests that promote the growth of this sector both nationally and internationally.

In this context, it is important to highlight the work of companies such as Manila S.A., one of the most important SMEs in Argentina dedicated to trout farming. With more than 10 years in the market, Manila S.A. has stood out for its commitment to quality and sustainability in the production of this species. Over time it has succeeded in placing its products in several international destinations, positioning Argentina as a referent in fish farming worldwide.

These trout are farmed in 700m³ floating cages where they do not exceed 10kg. per m³. Located in the Alicura reservoir of the Limay River, Patagonia, the ideal place for this cultivation.

Its most outstanding products are fresh and frozen trout fillet, canned preserves such as pâté in 90g cans and fillet with water and oil in 85g cans.



According to data from the “Fisheries and Aquaculture in Numbers” report published by the Food and Agriculture Organization of the United Nations (FAO), world production of fish from aquaculture has experienced sustained growth in recent years. In 2020, it reached a record 122.6 million tons, for a total value of USD 281.5 billion.

Source: Fisheries and Aquaculture in Numbers

Josefina Winter, technical director of INTI - Patagonia Norte, comments that through the Institution's Organic Production Diversification Program, with which the approach to organic production is achieved throughout the country, work was done on the technical-economic prefeasibility of the project, in order to develop a balanced feed with by-products from different processes, to feed trout from organic matrices and thus be able to obtain the “organic” certificate.

The company has extensive experience in exporting to Brazil, Canada, Chile and the USA, and is pursuing commercial opportunities in different markets around the world, with a product that is increasingly in demand due to its organic breeding, such as natural trout without pigmentation.

Gabriel Denot, member of the Technical Direction of Legal Metrology of INTI, explains that based on compliance with the Metrology Law 19511/1972, the Institute carries out primitive and periodic verifications throughout the national territory to all measuring instruments regulated by the aforementioned Law. Within the requirements demanded by the AFIP (Federal Administration of Public Revenues), and the Argentine Customs to qualify a balance as fiscal, it is necessary the certification of the measuring instruments, and thus streamline the process of import and export of the user. “Since 2020, we have been assisting the company in the metrological control of its scales in order to continue its presence in foreign markets”.

Martín Brosio, a member of the Process Technology and Services Department of INTI Pampeana, adds that his area provided assistance in heat penetration curves in canned food in order to demonstrate that the thermal process provided to the canned food is sufficient to consider that it is safe, meets the required degree of commercial sterility and is safe for consumption.



"In addition to supporting us in the long process of organic certification, **INTI advises us on metrological and quality issues. Their support strengthens us both in domestic markets, but especially to achieve our presence abroad**", reflects Mariano Slica, managing partner.

Manila works under sustainable practices and aligned to organic production. It also applies Good Manufacturing Practices (GMP). Its plant is certified by SENASA (Servicio Nacional de Sanidad y Calidad Agroalimentaria) for export. In addition, its production is certified for Hall Foods Market in the United States.

"We are chosen simply because of our product. Other companies choose other sizes of trout. Ours are small and medium-sized, their color is natural and they are not pigmented. There is no trout producer in Argentina with these characteristics. The rest of the exporting producers pigment their trout to obtain the salmon color. In Manila, we are the only ones that do not incorporate these chemical additives in the feed, thus maintaining its natural flavor", concludes Mariano Slica.

Fish farming, and in particular trout farming, plays a fundamental role in feeding the population and in the economic development of Argentina and the world. INTI, through its experience and know-how, continues to assist this industry to enhance its growth and ensure its sustainability. Companies such as Manila S.A. are an example of how Argentine fish farming can compete at an international level, generating employment and contributing to the country's development.



Manila S.A.
Bariloche, Río Negro

Trout farming

- Annual production capacity: 500 tn
- Production plant: 900 m²

• **HS CODE (NCM):**

- 0304.82.00.100 L / Trouts



Luis Solimeno e Hijos S.A.



Temptation in marine breeding

In the fish processing industry, Argentina is one of the main world players, becoming an important economic activity that contributes to economic growth, particularly in coastal and river communities, where food security is especially important. It is a sector in constant expansion, which finds in the quality of its products and in the sustainability of its practices the engine of its success.



Argentina has 140 processing plants and cold storage warehouses of fishery products authorized to export to the European Union, operated by 127 companies.

Source: Value Chain Reports. Fisheries - Ex - Ministry of Finance



Within this universe, the Argentine fish processing company Luis Solimeno e Hijos S.A., from the depths of the Atlantic Ocean, obtains the raw material for the production of frozen and breaded products that are now exported all over the world.

Luis Solimeno, descendant of a family of Italian fishermen, arrived in Argentina in 1935, when he was only 14 years old. For six years, he dedicated himself to fishing in the Paraná River and in the Río de la Plata, until he finally arrived in Mar del Plata in 1942. There, together with other immigrants who were also true fishing craftsmen, he contributed to turn this city into the main fishing port of the country.

In the beginning, Solimeno started his activity with a modest boat. However, with the help of his sons, they managed to transform this small family business into a robust company dedicated to fishing, which subsequently industrialized its production. Today this company is positioned as one of the most important in the Argentine fishing industry, employing more than 850 people and marketing more than 40,000 tons of product per year, both in the domestic and export markets.

Currently, **this Argentine company is the main exporter of hake filet to the Middle East and has been present in more than 30 countries for decades with its production of shrimp, squid and hake in logs.** In addition, for logistical reasons and due to the volume of demand, it wishes to expand its offer in the **Latin American, Central American and Caribbean markets** with its wide variety of products coated in breadcrumbs and naturally flavored. These include: hake (fillets, medallions and sticks); rabas, squid sticks and breaded shrimp. It also stands out for its pre-fried filet a la romana (breaded with flour and egg). **These products are processed the same day they are caught, which guarantees quality throughout the production chain.**

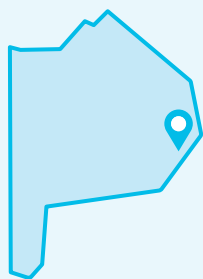
Nehuen Gramigna, member of the Department of Management Technologies of the Pampean Region and advisor of INTI's Mar del Plata node, explains that work was carried out on management technologies within the framework of the Productivity 4.0 project designed to improve the collection of information in real time for decision making.

Through the TANGO Kaizen Project, executed by INTI in cooperation with the Japan International collaboration Agency (JICA), the company was assisted in continuous productivity improvement processes through the survey of process variables and the generation of management indicators for the breeding lines. "The customer is becoming





more demanding every day, and although product quality is guaranteed, we want it to be optimal. For this reason, we turned to INTI, which provided us with tools to improve decision-making in different types of situations, enabling us to improve product quality, processes and personnel capabilities to address future problems”, said Alberto López, the company’s production engineer. Antonio Solimeno, the company’s general manager, reflects on the company’s highlights in the market. Firstly, he highlights its track record and recognition of more than 50 years, as well as its solid portfolio of clients abroad that has lasted for more than 30 years, which shows the trust and support it has earned. In addition, they are proud to be the only SME in the Argentine fishing sector that covers from extraction to the production of value-added finished products, both for export and for the domestic market. They have started with only one boat and are currently operating with their thirteenth, maintaining the same confidence and hope as in their beginnings.



Luis Solimeno e Hijos S.A.
Mar del Plata, Buenos Aires

Fishing and production of breaded and frozen products.

- Annual production capacity: On ships: 27,000 tons of frozen fish on board.
- On land: two plants: 10,000 tons of breaded products and 5,000 tons of frozen fish.
- Production plants: On land: two 11,000 m² covered moon plants and a 2,500 m² fish filleting plant.
- Offshore: 5,000 m³ of storage in the maritime fleet.

• HS CODE (NCM):

- 0303.66.00.111T / Hake. HCT Frozen on shore 1x14
- 0303.66.00.192W / Hake. HCT Frozen on board
- 0304.74.00.212J / Hake fillet without skin. Frozen ashore
- 0304.74.00.954P / Hake fillet without skin. Frozen on board
- 0306.17.10.290D/ Whole shrimp. Frozen on board
- 0307.43.10.110K / Whole squid. Frozen on board





International Cooperation



INTI has worked in Latin American and African countries in projects on Strengthening Fish Farming as a tool for diversification and rural development in different municipalities/communities.

This has led, for example, to the preparation, within the framework of a project with the Japan International Cooperation Agency (JICA), of a Fish Processing Guide for Fish Farming in collaboration between INTI and the Faculty of Veterinary Sciences of the National University of Asuncion, Paraguay.

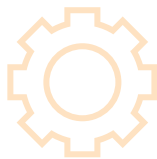
Training has also been provided in fish processing, preservation and marketing. INTI has also designed small-scale processing equipment, such as mobile equipment for freezing fillets and a depinning machine.





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