

PRODUCTS OBTAINED

DEHYDRATED EGG

✓ **Use:**

Raw material for feed:

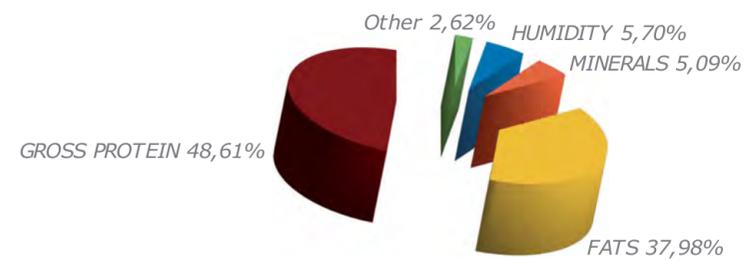
- Farm animals including hens
- Pets



Enterobacteriaceae

✓ **Microbiological analysis:**

Parameter	Method analysis	Result	Parametric Value
Salmonella	IT-PR-112	Not detected in 25 g	Absence / 25 g
Enterobacteriaceae	IT-PR-113	< 10 ufc/g	10-299 ufc/g



DRY SHELL

✓ **Use:**

Raw material for feed:

- Farm animals including hens
- Pets

Fertilizers and soil improvers

✓ **Microbiological analysis:**



Parameter	Method analysis	Result	Parametric Value
Salmonella	IT-PR-112	Not detected in 25 g	Absence / 25 g
Enterobacteriaceae	IT-PR-113	200 ufc/g	10-299 ufc/g

ADDING VALUE TO EGG NOT SUITABLE FOR HUMAN CONSUMPTION

STAGES OF THE PROCESS

1. Separation of liquid egg

The first step involves extracting the fluid and separating it from the shell. This operation is carried out using a centrifuge. The eggs fall into a perforated drum which rotates at a high speed. The centrifugal force pushes the egg out, while the shell is retained inside the drum. A screw conveyor which is turning inside the drum at a slightly faster speed scrapes the surface of the drum and removes any remaining shell deposits. The shell is pushed by the screw conveyor to the top of the drum and when it reaches the top it is propelled toward an alveolar valve which then introduces it into the pneumatic transport system.

Meanwhile the separated egg is pumped to a storage tank, prior to being processed, where it is chilled to prevent deterioration.

2. Process of egg

The liquid egg is treated and processed, by a transformation method in accordance with the European regulations on animal sub-products not intended for human consumption. Through this transformation a raw material for feed intended for farm animals, including hens, is obtained and which has high nutritional qualities.

Grinding and bagging

Prior to its final packaging, the dry egg undergoes a grinding process to ensure a more homogeneous distribution of sizes.

3. Shell processing

Part of the process used for egg treatment is also used for the shell. The management of the shell in the interior of the installation tends to be complicated so we opt for a pneumatic transport system which automatically sends all of the shell that has been separated to a storage silo without the need for any manipulation by operators.

The pneumatic transport system is essentially composed of: blower, intake valves, pipeline transport and storage silo.

The blower introduces into the pipe the ideal flow of air needed for transport. As each shell enters, a rotary valve maintains the air inside the pipe and introduces the shell in the transport system.

Then, a set of screw conveyor sends the shell from the stainless steel storage tank into the dehydrator.

Bagging

The resulting dry shell, is stored in 750 kg "big bags".

AUTOMATION

The plant is controlled by a touch screen which controls both production and cleaning.

All of the machinery and production processes are controlled by a PLC making plant operation very easy and allowing the operator to concentrate on other tasks. In case of any alarms or of any anomaly in the normal process, the PLC emits an audible alarm alerting the operator who can thus identify the problem on the screen.

DESIGN AND LOCATION OF THE PLANT

The drying plant has been designed so that it can be pre-mounted on two 40' containers, thus making it much more economical and easier for the customer as there is no need for any additional building to house the plant, it will also be tested at the factory minimizing final start up time.

AUXILIARY SERVICES

For the correct functioning of the entire system and to comply with the different regulations applying to the process it is necessary to install the following auxiliary equipment:

Air treatment system

The level of particles in the air used during the drying process is regulated by current legislation.

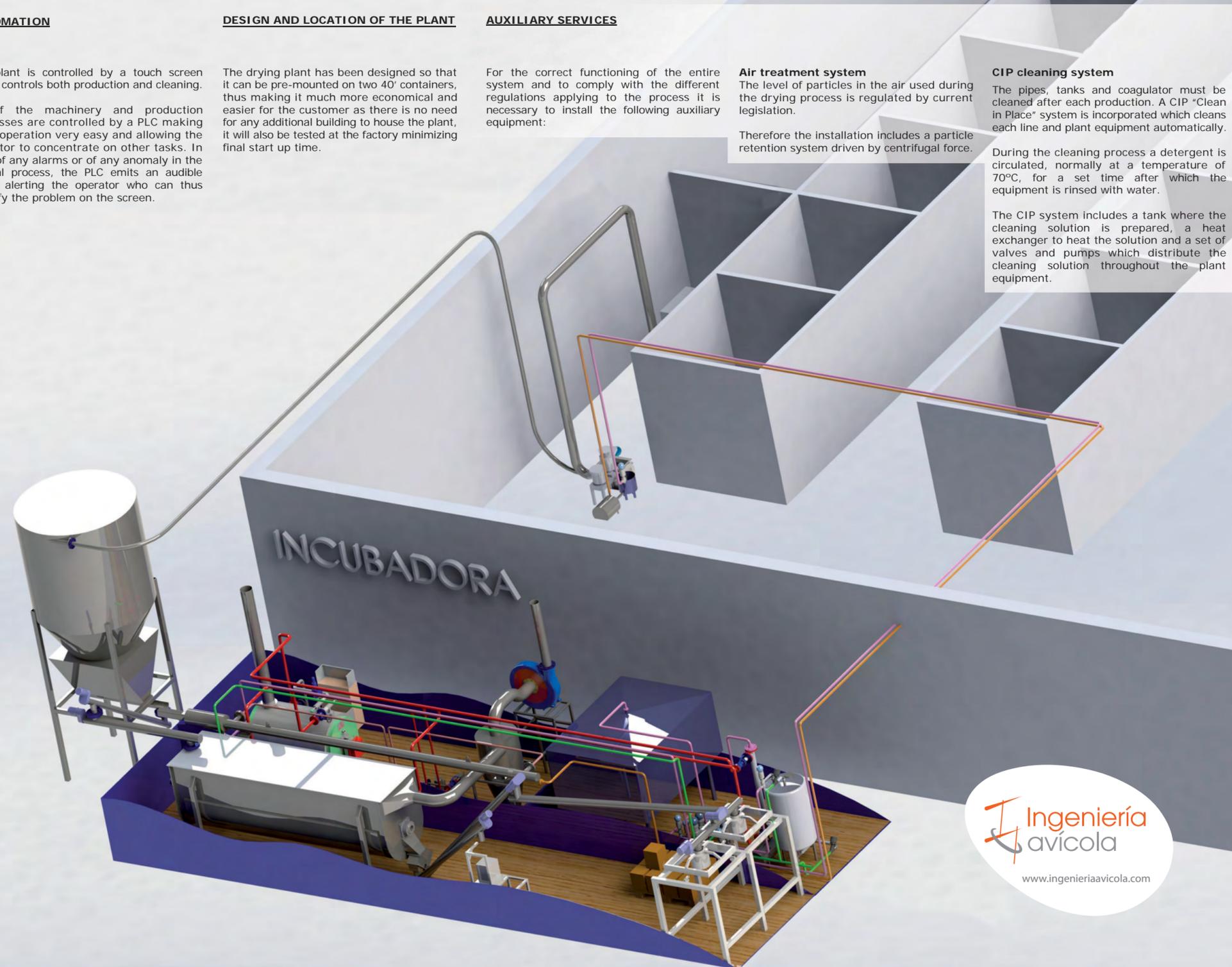
Therefore the installation includes a particle retention system driven by centrifugal force.

CIP cleaning system

The pipes, tanks and coagulator must be cleaned after each production. A CIP "Clean in Place" system is incorporated which cleans each line and plant equipment automatically.

During the cleaning process a detergent is circulated, normally at a temperature of 70°C, for a set time after which the equipment is rinsed with water.

The CIP system includes a tank where the cleaning solution is prepared, a heat exchanger to heat the solution and a set of valves and pumps which distribute the cleaning solution throughout the plant equipment.



ANIMAL BY-PRODUCTS LEGISLATION

Restricted eggs are defined by Regulations Governing the Inspection of Eggs in US, as eggs with cracks or checks in the shell, dirty eggs, incubator rejects, and inedible, leaker, or loss eggs. Cracked and dirty eggs may be shipped to an official egg products plant for processing and pasteurization. Otherwise, restricted eggs must be either destroyed or diverted for use as other than human food.

The production of waste and in particular animal by-products has recently generated wide concern and has resulted in greater monitoring and control by the authorities.

In 2009, EU published the Animal By-Products (ABP).

This situation has given rise to a reconsideration of the value of animal by-products and an analysis of how to turn an adverse situation into a business opportunity within the parameters which legislation offers.

The law applicable to animal by-products in EU is mainly as follows:

- **Regulation 1069/2009** of the European Parliament and of the Council establishes health rules for animal by-products and derived products not intended for human consumption.
- **Regulation 142/2011** of the European Parliament and the Commission establishes the implementing provisions of the regulation 1069 / 2009.
- **Regulation 1528/2012** establishes the rules applicable to animal by-products and derived products not intended for human consumption.

USE	CATEG.	REGULATION
Raw materials for farm animal feed	3	<ul style="list-style-type: none"> • 1069/2009 Art. 31 • 142/2011 Art. 21 and Anexx X
Fertilizers and soil improvers	2 and 3	<ul style="list-style-type: none"> • 1069/2009 Art. 32 • 142/2011 Art. 22 and Anexx XI • 1528/2012 Art. 11 and 12
Special-purpose animal feeding	2 and 3	<ul style="list-style-type: none"> • 1069/2009 Art. 18 • 142/2011 Art. 13 and 14 Anexx VI
Biogas and Compost	2 and 3	<ul style="list-style-type: none"> • 142/2011 Art. 10 and Anexx V • 1528/2012 Art. 8 and Art. 9
Derived products regulated by other Community legislation	2 and 3	<ul style="list-style-type: none"> • 1069/2009 Art. 33 and Art. 5
Feeding of pets	3	<ul style="list-style-type: none"> • 1069/2009 Art. 35 • 142/2011 Art. 24 and Anexx XIII
Other derived products	2 and 3	<ul style="list-style-type: none"> • 1069/2009 Art. 36 • 142/2009 Art. 24 and Anexx XIII • 1528/2012 Art. 12

OTHER PROCESSES

In addition to the processes described above, we have developed other processes to treat animal by-products:

OBTENTION OF SHELL WITHOUT ORGANIC MATTER

✓ **Use:**

Other derived products, not intended for human or animal consumption. Used as additives in industrial processes where the high purity calcium carbonate without organic matter is necessary.



Derived products regulated by other Community legislation: cosmetics

✓ **Carbon composition:**

Total carbon: 5.84%; Carbon organic < 0.01%

COMBUSTION OF MANURE AND ASH OBTENTION

✓ **Use:**

Obtaining energy. The combustion of manure is an exothermic reaction which yields heat that can be used to obtain steam or electricity.



Fertilizers and soil improvers. Compared with commercial inorganic fertilizers, manure ash provides 50% more potassium, 22% of the phosphorus, more than double the iron and the same percentage of zinc, as well as providing elements such as calcium and magnesium in large quantities and all forms of salts which are soluble and easily absorbed by soils, and which also serve as Ph stabilizers that prevent acidification of the soil. The absence of metal prevents contamination of the soil.

Other derived products not intended for human or animal consumption.

- Additive for mortar favoring the setting.
- Polish or abrasive cleaner.
- Regeneration of degraded soils

✓ **Composition:** see table

ASH COMPOSITION	
Al ₂ O ₃	0,92%
BaCO ₃	0,01%
CaO	1,95%
Ca	0,70%
CaCO ₃	24,75%
Fe ₂ O ₃ /FeO	0,84%
KPO ₃	3,40%
K ₂ O	25,75%
MgO	0,32%
MgCO ₃	2,70%
Mn ₂ O ₃	0,09%
Na ₂ NH ₄	0,94%
Ca ₁₀ (PO ₄) ₆ O	5,93%
SiO ₂	28,59%
SrCO ₃	0,03%
TiO ₂	0,02%
ZnO	0,07%
SO ₃	2,99%



ADDING VALUE TO ANIMAL BY-PRODUCTS

