

**Profitability study
about meats in
refrigerated display case**

HydroFresh
NEBUSYSTEM FOGGER

Why does meat in a cold display case dry out and darken?

Although it may seem contradictory, **the cold does not always protect the meat**. In a typical supermarket refrigerated display case, several factors combine to cause **dehydration** and **browning** of the product.

Let's take it one step at a time.

1. Cold dries out because cold air contains little moisture

Cold air has a **very low capacity to retain water vapor**. When meat is displayed in a display case:

- Cold air "absorbs" moisture from the surface.
- Constant **evaporation** occurs .
- The surface becomes **dry, hard and matte**.

This process is exactly the same as what happens in a domestic refrigerator when a food is uncovered.

2. Airflow Accelerates Dehydration

Refrigeration cabinets work with **refrigerated air currents** that circulate continuously to keep the temperature stable.

That flow:

- It drags surface moisture.
- Increases the rate of evaporation.
- It causes meat to lose water faster.

It's a wind-like effect on the skin: the more air it circulates, the faster it dries.

3. Oxidation darkening of myoglobin

Red meat owes its color to **myoglobin**, a protein that changes color according to its chemical state. When the surface dries out:

- Less water is available.
- Myoglobin oxidizes faster.
- The color changes from bright red to **dark brown**.

This darkening **does not necessarily mean that the meat is spoiled**, but it does indicate that it has lost freshness and visual appeal.

4. Thermal contrast when replenishing product

When the meat goes from the cold room to the display case:

- Condensation occurs.
- That initial moisture is quickly evaporated by cold, dry air.
- The dehydration process is especially accelerated during the first hour.

CONCLUSION: The contribution of moisture in the preservation of fresh produce is equally or more important than cold.

Methodology and parameters of the study

This study compares weight loss losses in meats exposed in a refrigerated display case.
(Pork rib, beef steak and chicken breasts)

Point of sale: Spanish chain supermarket with 238 points of sale

Date: Wednesday, March 16, 2022

Scale: METTLER Toledo BC-H22 (Weight expressed in grams)

Showcase Measurements: Infrico VEX37 CP (3.75 m/linear)

Indoor temperature of the supermarket: 22.5°C

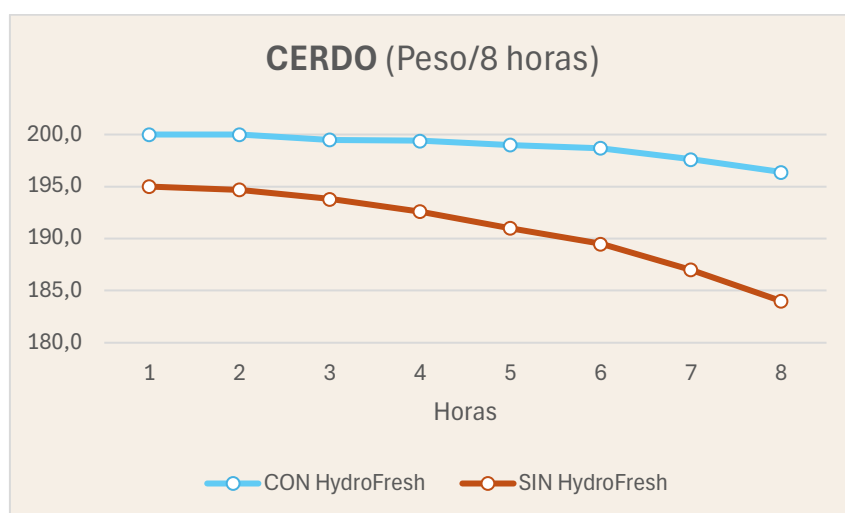
Nebulizer equipment used: Model HydroFresh HAFV6

Procedure:

Samples of meat product of similar weights were submitted to a comparison of weight loss and appearance due to dehydration due to the effect of refrigeration.

Every hour, the weight of the nebulized sample and that of the unnebulized sample were taken.

PORK (8h)



Results:

- Without **HydroFresh** , there were losses of **5.64%** in 8 hours.
- With **HydroFresh** , the losses were **1.80%** in 8 hours.
- The reduction in waste with the **HydroFresh** system was **68.09%** in 8hours.
- The savings are equivalent to **3.84%** of the weight of the pork rib.

Economic Savings Calculations to avoid evaporation loss:

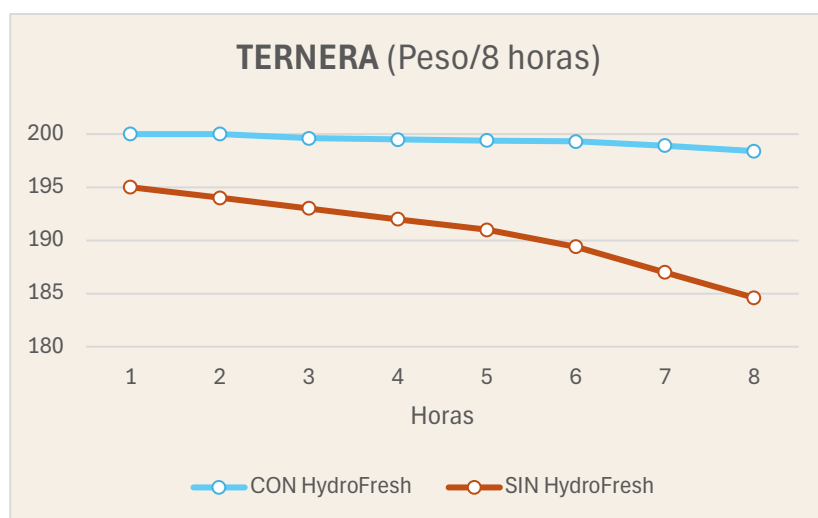
Monthly Sales	Monthly savings	Annual savings
20.000 €	768 €	9.216 €
40.000 €	1.536 €	18.432 €
60.000 €	2.304 €	27.648 €
80.000 €	3.072 €	36.864 €



Visual Appearance

The pork rib nebulized with the **HydroFresh** system presented optimal appearance, color and freshness characteristics favorable for sale, unlike the piece that was not nebulized.

BEEF (8h)



Results:

- Without **HydroFresh** , there were losses of **4.93%** in 8 hours.
- With **HydroFresh** , the losses were **0.54%** in 8 hours.
- The reduction in waste with the **HydroFresh** system was **85%** in 8 hours.
- The savings are equivalent to **4.53%** of the weight of the calf.

Economic Savings Calculations to avoid evaporation loss:

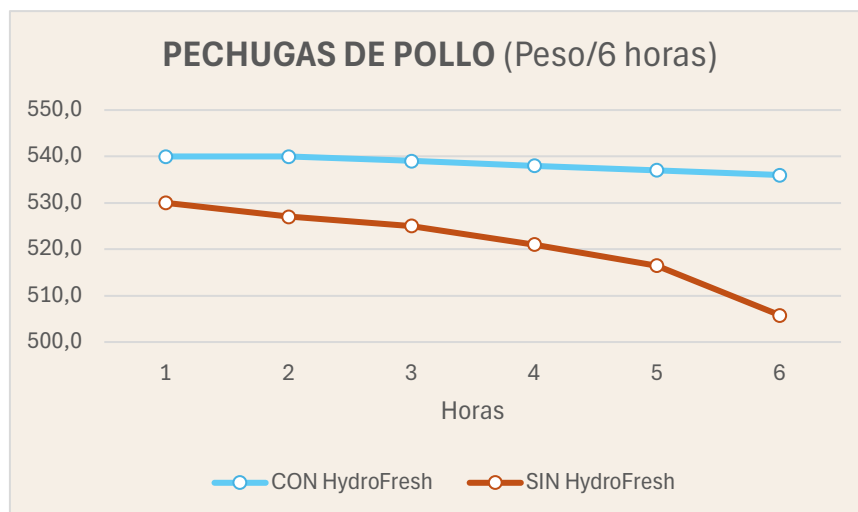
Monthly Sales	Monthly savings	Annual savings
20.000 €	906 €	10.872 €
40.000 €	1.812 €	21.744 €
60.000 €	2.718 €	32.616 €
80.000 €	3.624 €	43.488 €



Visual Appearance

The calf that was with the HydroFresh nebulization system presented optimal appearance, color and freshness characteristics that were favorable for sale, unlike the veal that was without nebulization.

CHICKEN BREASTS (6h)



Results:

- Without **HydroFresh**, there were losses of **4.62%** in 6 hours.
- With **HydroFresh**, the losses were **0.74%** in 6 hours.
- The reduction in waste with the **HydroFresh** system was **84%** in 6 hours.
- The savings are equivalent to **3.80%** of the calf's weight.

Economic Savings Calculations to avoid evaporation loss:

Monthly Sales	Monthly savings	Annual savings
20.000 €	766 €	9.192 €
40.000 €	1.532 €	18.384 €
60.000 €	2.298 €	27.576 €
80.000 €	3.064 €	36.768 €



Visual Appearance

The nebulized chicken breasts with the **HydroFresh** system presented optimal appearance, color and freshness characteristics for sale, unlike those that were not nebulized.

CONCLUSIONS

The integration of the **HydroFresh** misting system into the control of meat weight loss has proven to be completely effective and cost-effective for the section.

With the HydroFresh **nebulization system**, after 6/8 hours of exposure, a very slight weight loss was observed in the nebulized samples, while the non-nebulized parts suffered considerable weight loss. The average loss without a nebulization system exceeds 4%.

PROFITABILITY

Evaporation loss savings: **4.05%**.

From the data provided by our customers we can affirm that in addition to the savings in weight loss for evaporation we must add:

Savings of approximately **3%** by avoiding waste because we extend the shelf life of fresh produce.

Estimated **2%** increase in sales in the section by displaying a fresh product, maintaining its organoleptic qualities: colour, freshness, appearance, etc.

TOTAL: 9 % more profitability for butcher seccón

