

# Handling Difficult Ingredients: How One Food Processor Improved Flow and Reduced Product Loss



Bulk ingredients are often purchased in large quantities to reduce cost and improve handling efficiency. However, materials that behave predictably in theory can present unexpected challenges once they are introduced into a production environment.

In food processing applications, certain ingredients, particularly those that are fine, hygroscopic, or prone to compaction, can create persistent issues with flow, consistency, and product loss. These challenges are often magnified when materials are stored or transported in bulk bags, where environmental exposure and handling conditions can affect material behavior before it even enters the process.

For one food processor, these issues became apparent during the expansion of a premium pasta production line.

## When Materials Don't Flow as Expected

The processor introduced a new line to meet growing demand for small-batch pasta products. A key part of the process required dissolving granulated salt into water to achieve a consistent salinity level prior to cooking.

The salt was delivered in 2,000 lb bulk bags and had a fine particle size with hygroscopic properties, meaning it readily absorbed moisture from the air. Over time and during transport, the material formed large, dense clumps within the bags.

- These clumps created multiple challenges:
- Inconsistent discharge from the bulk bags
- Difficulty achieving uniform dissolution in water
- Variability in process control and product quality
- Risk of incomplete bag emptying and product loss

As a result, a relatively simple ingredient introduced complexity into the production process.

## Why Standard Approaches Fall Short

In many bulk bag unloading applications, flow issues caused by compaction can be addressed using agitation or massaging systems that help loosen material inside the bag.

However, in this case, the salt had formed particularly hard agglomerations. Traditional agitation methods alone were not sufficient to break apart the clumps and restore consistent flow.

This highlights a common challenge in bulk material handling:

***Not all materials respond to standard solutions, particularly when material characteristics and environmental factors combine to create more severe flow issues.***

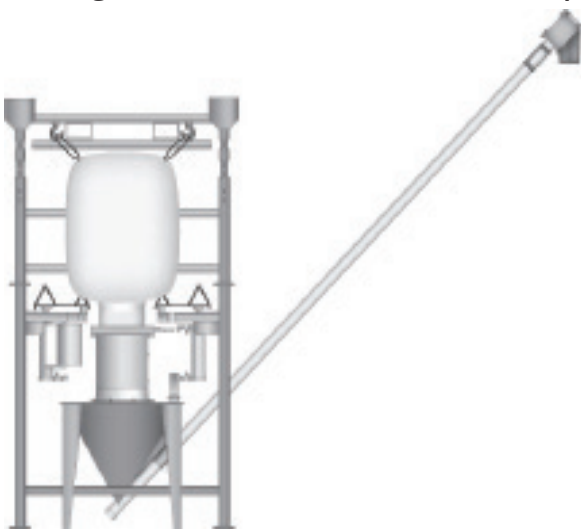
### Improving Material Flow at the Source

To address the issue, the processor implemented a bulk bag unloading approach designed to actively break down the compacted material during discharge.

Instead of relying solely on external agitation, the system incorporated mechanical breaker elements that applied force directly to the clumped material within the bag. These elements were arranged at varying heights and positions, allowing them to progressively fracture the dense agglomerations as material was discharged.

This approach helped restore a more consistent flow of material from the bag, reducing variability at the point of introduction and stabilizing the downstream process.

### Moving Material Within a Constrained Space



An illustration of the complete salt handling system. The engineered unloader with breaker bars with an integral hopper and Helix Flexible Screw Conveyor.

In addition to improving flow, the processor needed to move the salt to a mezzanine approximately 12 feet above the production floor, where it would be introduced into a reactor for pasta cooking.

The facility presented space constraints, including limited ceiling height and the need to integrate new equipment into an existing layout. Rather than adding multiple transfer points or extending the system footprint, the solution incorporated a compact conveying approach that moved material directly from the discharge point to the elevated destination.

By aligning unloading and conveying functions, the system minimized handling steps and reduced opportunities for material loss.

### Reducing Product Loss and Improving Consistency

With improved flow at the point of discharge and a more streamlined conveying path, the processor was able to address several key operational challenges.

Consistent material flow allowed for more reliable control of salinity levels during the cooking process, supporting product quality. At the same time, the ability to effectively empty bulk bags reduced residual material loss, improving overall yield.

By stabilizing the system at its starting point and reducing unnecessary handling, the processor improved both efficiency and process control.

### Lessons for Handling Difficult Materials

While this application focused on salt, the underlying challenges are common across many food processing operations.

Materials that are fine, moisture-sensitive, or prone to compaction can behave unpredictably when stored or transported in bulk. When these materials are introduced into a system without adequate control, they can create downstream issues that affect performance, consistency, and product recovery.

Key considerations for addressing these challenges include:

- Evaluating how materials behave after storage and transport, not just in ideal conditions
- Ensuring consistent and controlled discharge at the point of introduction
- Reducing unnecessary transfer points that increase handling and variability
- Integrating equipment to simplify flow and minimize product loss

### **Conclusion: Solving the Problem at the Source**

Difficult material behavior is often addressed downstream, after issues have already affected system performance. However, as this application demonstrates, improving control at the point of material introduction can have a significant impact on the entire process.

By focusing on how material enters and moves through the system, food processors can reduce variability, improve efficiency, and minimize product loss, without requiring a complete system redesign.



### **About Hapman**

Hapman is a U.S.-based manufacturer of bulk material handling equipment with more than 80 years of experience supporting food processors and other industries. From bulk bag unloading to pneumatic conveying, Hapman systems are designed to improve material flow, reduce product loss, and support sanitary operations.

Explore additional resources and application insights at [hapman.com](http://hapman.com).