

LEADERSHIP
THAT
INVOLVES
THE FUTURE



INDUMAK

RICE INDUSTRY

**Impact & Innovation
in the production
techniques
saving costs**



Presented by: Gelson Schmidt



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CEO of INDUMAK USA (Texas)

With over 25 years of experience in the industry

"In addition to my role at Indumak, I have actively participated in industry discussions, such as webinars on trends and innovations in automatic packaging, demonstrating my engagement with the broader manufacturing community and now honored in being a speaker at 2025 Rice Market & Technology Convention."



INDUMAK



- + 60 years of history
- + Strong and innovative **industrial solutions**
- + 10000 clients in **Brazil** and around the **world**



PACKAGING
MACHINES



BALING



BAGGING



BOXING MACHINES



PALLETIZER

Impact of Modernization on the Rice Industry

Efficiency Gains: Automation and real-time monitoring systems have streamlined operations, reducing production time by up to 30%.

Quality Improvement: Sophisticated milling technologies have led to more consistent grain quality, fewer losses, and better market value.

Environmental Impact: New techniques emphasize resource conservation, minimizing water use and energy consumption, and reducing carbon footprints.

Modernization is transforming the rice industry by boosting efficiency, reducing waste, and enabling sustainable growth through smart packaging and automation technologies.

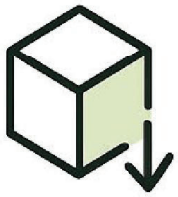


Automation minimizes energy consumption, reduces material waste, and optimizes operational precision-making production not only faster but also significantly more sustainable.



**Precision filling
in packaging
machines
reduces waste**

PACKAGING OPTIMIZATION DRIVES ENVIRONMENTAL SUSTAINABILITY IN THE RICE INDUSTRY



**REDUCES
MATERIAL USE**



**LOWERS CARBON
EMISSIONS**



**MINIMIZES
WASTE**



**IMPROVES
RESOURCE
EFFICIENCY**

Post-Consumer Recycled Plastic (PCR)

Advantages of PCR in Rice Packaging industry

- Using PCR helps decrease the volume of plastic sent to landfills.
- PCR packaging consumes less energy and emits less CO₂ compared to virgin plastic.
- Supports companies in meeting sustainability demands from retailers and consumers.
- New PCR formulations work efficiently with sealing and packaging automation systems.



Innovations Driving Cost Reduction

1. Automation and Robotics

- Smart Packaging Lines: Automated weighing, packaging, and palletizing systems enhance accuracy and cut labor costs.
- Sensor-Based Sorting: Optical sorters equipped with AI detect defects with high precision, ensuring only the best grains reach the market.

These integrated solutions not only boost operational efficiency and product consistency but also provide real-time data for better production monitoring, quality control, and decision-making, leading to greater competitiveness and scalability for manufacturers.

Innovations Driving Cost Reduction

2. Lean Production Strategies

- **Minimized Waste:** Innovations in husk utilization, like bioenergy production or conversion into organic fertilizers, turn by-products into revenue streams.
- **Optimized Logistics:** Advanced supply chain software allows for better inventory management and transportation planning, reducing overall operational expenses.

They streamline production workflows, reduce human error, and deliver faster, more reliable output — key drivers for scaling operations and staying competitive.

Precision Filling

Aspect	Precision Weighing Filling	Volumetric Filling
Accuracy	High (± 0.1 – 0.5% deviation)	Medium to Low (± 1 – 3% deviation depending on grain flow)
Principle of Operation	Uses load cells or multihead weighers to measure exact mass	Fills based on volume (e.g., cup, auger, or chamber size)
Consistency	Very consistent across varying product densities	Inconsistent if product bulk density changes (e.g., moisture, variety)
Product Suitability	Ideal for irregular, dusty, granular products like rice	Better for uniform, free-flowing products with stable density
Adjustment Flexibility	Automatic adjustments based on target weight	Requires manual calibration when product characteristics change
Material Savings	Reduces product giveaway by precise dosing	Higher risk of overfilling (cost impact) or underfilling (compliance risk)
Cost and Complexity	Higher equipment cost and more sophisticated control systems	Lower cost, simpler technology
Integration with Automation	Fully integrable with PLCs and SCADA systems for traceability	Less flexible for real-time data feedback and control

PRECISION WEIGHING FILLING vs. VOLUMETRIC FILLING

Precision Weighing Filling	Volumetric Filling
High ($\pm 0.1-0.5\%$ deviation)	Medium to Low ($\pm 1-3\%$ deviation depending on grain flow)
Very consistent across varying product densities	Inconsistent if product bulk density changes
Ideal for irregular, dusty, granular products	Better for uniform, free-flowing products with stable density
Adjustment flexibility based on target weight	Requires manual calibration when product characteristics change
Reduces product giveaway by precise dosing	Higher risk of overfilling or underfilling

Precision Filling - Volumetric



Single Cup Filler



Rotative Cup Filler

Precision Filling - Weighing

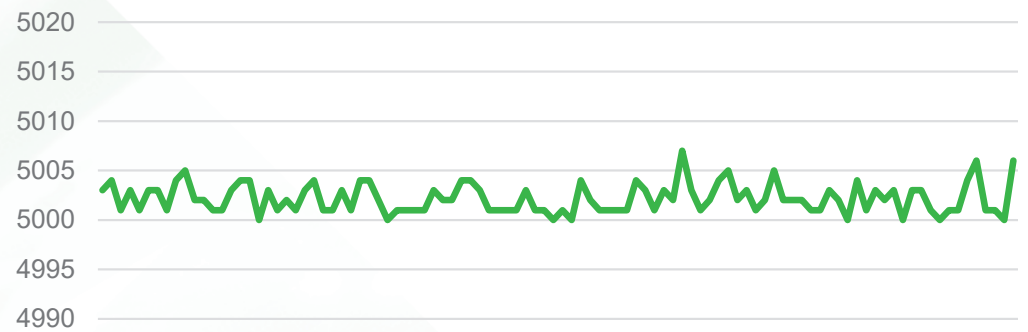


Scatter Plot

Volumetric - 100 drops



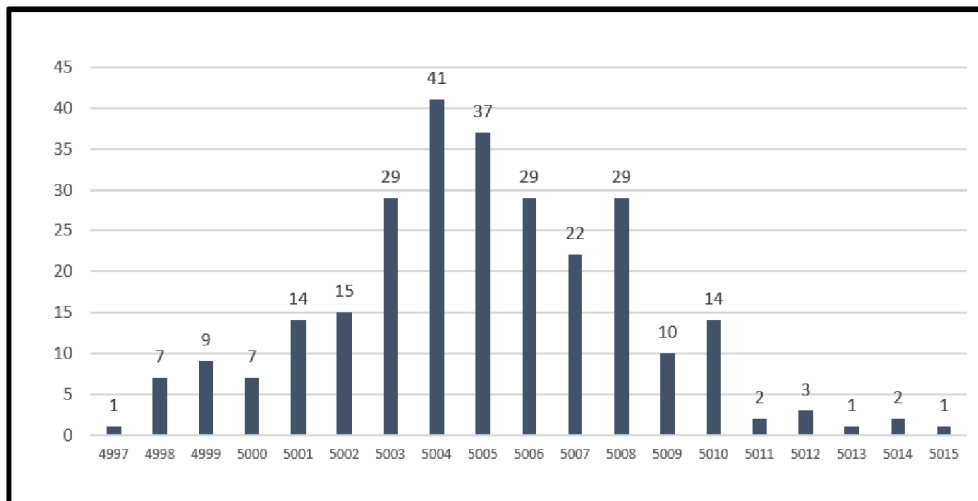
Gravimetric - 100 drops



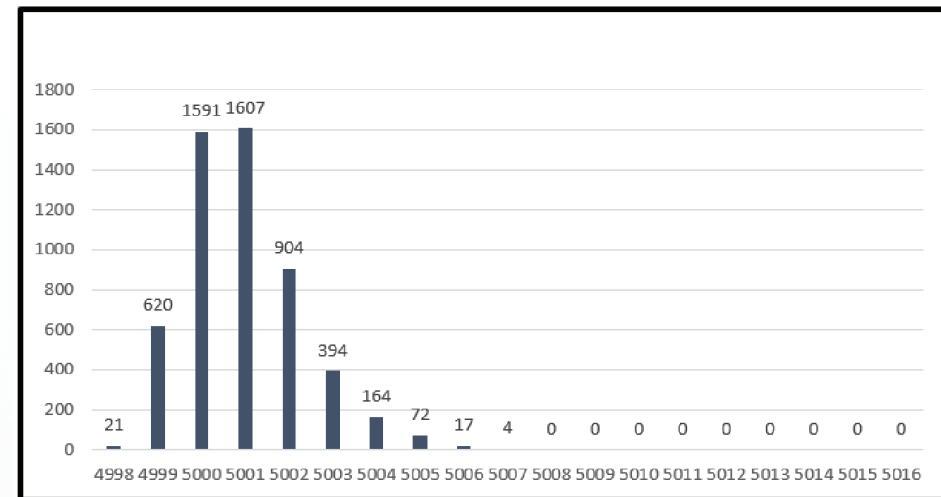
Target: 5kg (11lbs)

Comparative: Volumetric x Gravimetric

Volumetric

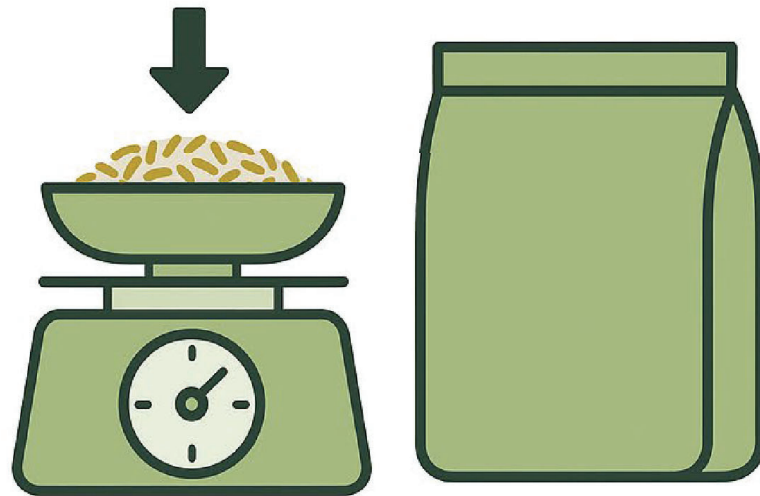


Gravimetric

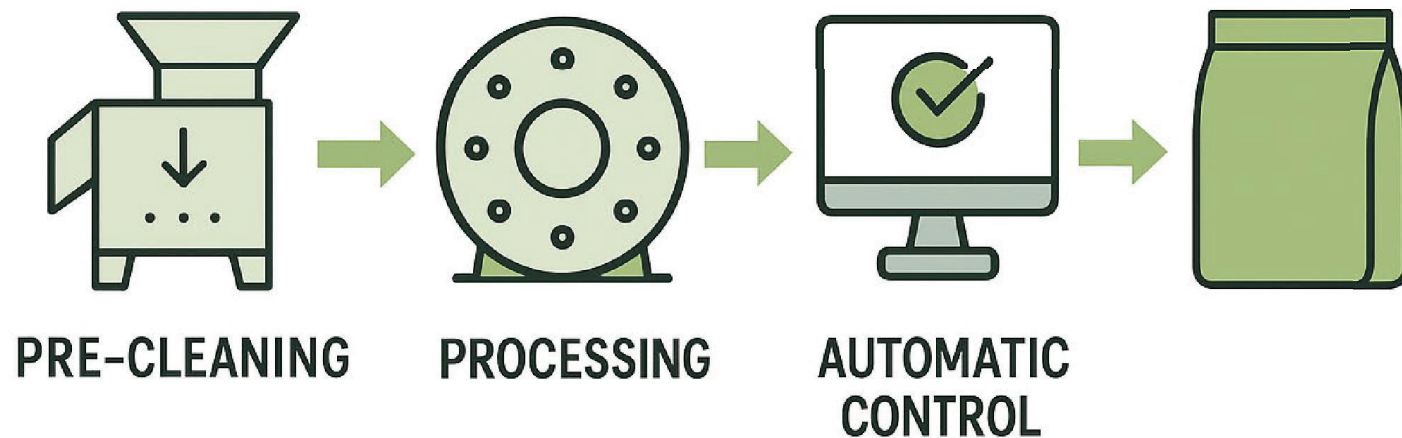


Association weights and quantities

**Less waste on filling drives
to more efficiency and
sustainability in the industry**



Some companies are implementing **fully integrated solutions** from pre-cleaning to packaging with minimal human intervention



Future Trends in Rice Production Techniques

- Artificial Intelligence (AI) and Machine Learning (ML) will increasingly optimize every step of production.
- Blockchain for Traceability will become standard practice, adding value to exports by guaranteeing product origins and sustainable practices.
- Customization and Flexibility in machinery design will allow rice processors to quickly adapt to different markets and grain varieties.

Smart packaging lines empower businesses to meet growing market demands with efficiency, flexibility, and superior product presentation — all while optimizing their bottom line.



Innovations Reshaping the Rice Industry:

Automation

Increases efficiency, consistency, and product quality while reducing labor costs.

Energy Efficiency

Cuts operational expenses and supports compliance with environmental standards.

Waste Optimization

Maximizes resource use, creates new revenue streams, and reduces environmental impact.

Digitalization & Data Analytics

Enhances production monitoring, proactive maintenance, and faster decision-making.

Strategic Advantage

Innovation is no longer optional — it is essential for competitiveness and sustainable growth.



Conclusion:

The automation of industrial processes is no longer a trend but a fundamental shift, enabling the rice industry to achieve higher efficiency, precision, and global competitiveness.

As we look forward, the message is clear: those who innovate will lead the next chapter of growth in the rice industry.

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