The Ultimate Guide ToArtificial Rice Production LineUpdated 2025

Detail Introduction :

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Artificial Rice Production Line utilizes broken rice, corn, millet, wheat, oats, buckwhea beans, and starch as primary ingredients, supplemented with essential vitamins and minerals to fortify its nutritional profile. The process begins with the meticulous mixing these components, ensuring a balanced blend of flavors and textures. The mixture is fed into a high-precision screw extruder, where it undergoes intense pressure and he transforming it into perfectly shaped grains that mimic the appearance and texture of rice. These extruded grains are subsequently conveyed to a rotary dryer, where they gently tumbled and dried to achieve the desired moisture content, preserving their int and enhancing shelf life. This innovative production method results in a nutritious, ve artificial rice that not only looks and feels like traditional rice but also offers comparab culinary versatility, making it an excellent alternative for various dietary needs.

In the rice processing industry chain, dealing with broken rice has always been a cha for companies' profitability. Traditionally, about 15%-20% of broken rice is usually sol prices as animal feed (worth less than one-third of whole grain), often ending up in ba and farms where it provides basic sustenance for livestock. Alternatively, it is used in processing such as brewing, where its potential is barely tapped, resulting in significa underutilization of its value. The aroma of broken rice, slightly different from whole gr often goes unnoticed in these applications, leading to a waste of its unique flavor pro However, the emergence of new-generation artificial rice production lines is complete changing this situation—by converting low-value broken rice into high-value nutritiona enhanced rice, it not only achieves efficient resource utilization but also opens up a n profit growth channel. These advanced production lines employ cutting-edge technol reconstitute broken rice into a form that retains its nutritional benefits while enhancing texture and taste, making it indistinguishable from whole grain rice in both culinary an health aspects. This innovation not only maximizes the economic value of broken rice also promotes sustainability by reducing waste in the food industry.

Technology Empowerment: The Transformation from Waste By-products to Premium Food

Micronization recombination technology grinds broken rice into fine powder with a me of 150 (with a starch damage rate below 8%) at low temperatures, eliminating its orig structural defects. Then, it undergoes molecular recombination in a twin-screw extruc 75-85°C. The crystal structure of the restructured rice grains is similar to that of whole grains, reaching a similarity of 92%, completely solving the traditional issues of broke products such as easy gelatinization and poor texture.

Nutrient-targeted fortification?

Adding B vitamins, iron, zinc, calcium, and other trace nutrients to the raw materials, party testing shows that after cooking, nutrient retention exceeds 90%, significantly outperforming spray coating methods (less than 65%).

Precise shape replication?

Customized molds can simulate the physical characteristics of different rice varieties indica and japonica rice, producing grains with length-to-width ratio tolerances contro within ±0.1mm, transparency exceeding 88%, and maintaining grain integrity after ste

Consumer Resistance: The "Taste and Texture" Barrier

Even though they know it’s good for them, many people avoid commercial fortified ric because it just doesn’t feel or taste right. They complain about broken grains, odd sh and a texture that’s either too mushy or too coarse when cooked. The grains often la delicate sheen and uniformity of high-quality regular rice, which can make the dish ap unappetizing. It lacks the aromatic fragrance that wafts up as you cook, the satisfying firmness that gives each bite substance, and the delightful chewiness that makes eve mouthful enjoyable. When people say it’s ‘not tasty’ or ‘unnatural,’ all the nutritional b don’t matter. The visual appeal, sensory experience, and overall palatability are cruci factors that influence consumer acceptance. Getting the texture and look just right is biggest challenge for fortified rice, as achieving a balance between fortification and maintaining the natural qualities of rice remains elusive.

Production Realities: The Cost-Efficiency Squeeze

Traditional Fortified Rice process methods involve repeated soaking, steaming, coati
drying to attach nutrients to grains. This intricate process creates three main challeng
Low Efficiency: Cumbersome steps throttle throughput.
High Energy Waste: Steam and electricity consumption skyrockets.
Quality Risks: Fragile grains crack during processing, slashing yields.
The result? Soaring costs that erode profitability before products even reach shelves.

Process Of Fortified Rice Production Line

GRINDER:The grinder is specifically designed for the reprocessing of broken rice. Th
strength alloy grinding disc pulverizes rice fragments or old rice into ultra-fine powder
(particle size ? 100?m), ensuring uniform nutrient mixing in subsequent steps. The
temperature control system maintains the grinding temperature below 40°C to prever
pre-gelatinization, providing an ideal raw material foundation for restructured rice grai
SCREW CONVEYOR: Fully enclosed dust-free conveying and crushing of materials,
food-grade stainless steel shaftless screw conveying at a 15° incline for smooth mate
advancement. A specially designed anti-arching structure prevents layering or clumpi
nutritional rice powder during conveyance, ensuring continuous production.
KING78 TWIN-SCREW EXTRUDER (with cooling system)
• Core processing equipment of Artificial Rice Production Line

• Counter-rotating twin screws complete the plastic reformation of rice vermicelli at a temperature range of 75-85°C, with screw configuration divided into zones for convey compressing, and melting
• Built-in nutrient liquid injection ports for molecular-level encapsulation of nutrients
• Ruby molds precisely replicate the natural shape of rice grains (aspect ratio 1.6-1.8
• Barrel dual circulation cooling system (water temperature ±1°C) instantly shapes the vermicelli, locking in nutrition and texture
CHILLER: Rapidly cool extruded rice grains with 5°C chilled water, reducing the core temperature from 85°C to 25°C within 90 seconds. Quickly pass through the starch retrogradation temperature range of 60-40°C to prevent cracking and deformation of grains, maintaining their elastic texture.
VIBRATE COOLER 3M WITH FAN: The three-layer reciprocating vibration screen, combined with vertical airflow (wind speed 2.5 m/s), efficiently removes the water film surface of rice grains. The amplitude and frequency are intelligently adjusted to ensu collision damage to the rice grains, and the moisture content is uniformly reduced to 1%.
HIGH PRESSURE AIR CONVEYOR: Cooling rice grains with a clean airflow of 0.6 M with a conveying distance of 50 meters and a breakage rate less than 0.1%. The enti pipeline undergoes food-grade polishing to eliminate the risk of secondary contamina nutritional rice.
HOT AIR CIRCULATION OVEN 7 LAYERS 12 METERS(Key energy-saving equipm
Gradient temperature control: 65°C (upper layer for rapid moisture removal) ? 55°C (layer for stress relief) ? 45°C (lower layer for moisture balance)
Heat pump waste heat recovery system reduces steam consumption by 60%
12-meter mesh belt ensures that rice grains achieve ?25 minutes of scientific drying, final moisture content of 14.5% ± 0.3%
ELECTRICAL HEATING (WIDTH BELT): A 1.2-meter wide frequency conversion me with built-in infrared supplementary heating device eliminates temperature difference anomalies at the edges of the drying tower (lateral temperature difference ? ±1°C), en uniform moisture content for each grain of rice.
COOLING CONVEYOR: The 20-meter slow cooling zone is equipped with an automa temperature and humidity control system (25°C/45% RH), ensuring that the grains ac moisture equilibrium within 15 minutes of uniform conveyance, thereby addressing th of moisture gradient differences between the inside and outside after drying.
PACKAGING MACHINE:
• Nitrogen displacement with oxygen purity ? 99.9% (residual oxygen < 0.5%)
• Heat-seal strength > 45N/15mm, ensuring a 180-day freshness period

What Is The Advantages Of Artificial Rice Production L

1.Compact structure novel design and stable performance

A compact structure novel design with sleek, minimalist lines offers a modern aesthe appeal. This innovative design ensures efficient space utilization without compromisi functionality. The stable performance guarantees reliability and durability, providing consistent results even under demanding conditions. The robust build quality incorpo high-grade materials that withstand wear and tear, ensuring long-term usability. The seamless integration of advanced technology within its compact form enhances user experience, making it a versatile choice for various applications.

2.High automatic

Highly advanced automation systems seamlessly integrate cutting-edge technology t streamline processes, enhancing efficiency and accuracy. Additionally, these automa solutions offer robust security features, safeguarding sensitive information and mainta compliance with industry standards. The user-friendly interface and intuitive design m accessible for operators at all skill levels, fostering a more efficient and productive wo environment.

3.Easy operation

Easy operation with intuitive controls, allowing users to navigate through menus effor The streamlined interface ensures minimal learning curve, making it accessible even those who are not tech-savvy. Smooth touch responses and responsive buttons enha

user experience, providing a seamless interaction. The clear and concise instructions
users step-by-step, ensuring a hassle-free setup and usage.

4.Energy saving

Using an extruder barrel waste heat recovery system (energy-saving rate ? 18%), 75
cooling water is used to preheat the air entering the drying tower, reducing steam
consumption. The drying process employs a 7-layer gradient drying tower combined
heat pump technology to achieve 60% reuse of exhaust heat energy. The core powe
equipped with permanent magnet synchronous motors, which save 25% more electri
compared to traditional asynchronous motors.

5.Environmental protection

The production line constructs an energy circulation system, deeply recovers and reu
residual heat, achieves clean emissions, ensuring efficient operation of nutritious rice
production while safeguarding green ecology.

6.Small floor space

This nutrition rice production line adopts a three-dimensional integrated design, utilizi
vertical equipment layout and process optimization to significantly reduce factory spa
requirements. Core units such as the seven-layer hot air circulation drying tower effic
utilize three-dimensional space, reducing floor area by 40% compared to traditional li
with the same capacity. This intensive design is particularly suitable for renovation pr
with limited factory space, allowing you to upgrade capacity without expansion.

Conclusion

The technological advantages of this production line are prominently reflected in thre aspects: first, genuine rice experience without compromise. Unique forming and dryi technologies ensure that cooked grains are distinct, soft, chewy, and almost indistinguishable from high-quality regular rice in aroma and texture. Second, energy efficiency is visibly improved. The integration of waste heat recovery systems, low-en design, and automated assembly lines significantly reduces production energy consu while greatly increasing capacity. Third, nutritional protection is more reassuring. Thr the process, gentle processing and precise control maximize the preservation of add nutrients and the natural structure of the grains, ensuring the nutritional value and sta quality of the final product. Truly achieving beauty, taste, and better health!

Reference

The following are five authoritative foreign literature websites in the field of Industrial machinery:

1. Food Engineering Magazine

Website: https://www.foodengineeringmag.com/

2.Food Processing Magazine

Website: https://www.foodprocessing.com/

3.Journal of Food Engineering

Website:https://www.journals.elsevier.com/journal-of-food-engineering

4. Food Manufacturing Magazine

Website:https://www.foodmanufacturing.com/

5. International Journal of Food Science & Technology

Website:https://onlinelibrary.wiley.com/