

Rethinking bearing technology for safer, smarter food production

How hygienically designed bearing units reduce risk, increase reliability, and support sustainability goals.



Executive summary

In the food and beverage industry, production reliability and food safety are inseparable. Bearings, though small, are central to both. When improperly specified, they can become hidden sources of contamination, downtime, and excess maintenance.

This paper explores how SKF's Food Line ball bearing units address the most common failure modes in food production. These hygienic, reliable bearing units support food safety compliance, personal safety, operational uptime, and sustainability. Through specialized sealing systems, food-safe materials, and lubrication technologies, SKF provides an end-to-end response to hygiene-critical environments and eliminates the need for relubrication.

1. Bearings impact both food safety and plant performance

Rolling bearings are essential components in all rotating equipment. If they fail, it disrupts production, increases maintenance costs, and may compromise food safety. In an industry where maintaining hygiene compliance is essential, each bearing plays a critical role.

The cost of a food recall is high. A Harris Poll reveals that:

- 55% of consumers would temporarily stop buying a trusted brand after a recall,
- 15% would stop buying it altogether,
- 21% would avoid any product from the same manufacturer.

Manufacturers must address food safety at the component level to avoid or minimize such risks. Bearings, lubricants, and housing materials should all be food-grade and designed with hygiene in mind.

Unreliable bearings are more than just a maintenance issue. In food production, poor reliability leads to unplanned downtime. This disrupts scheduled cleaning cycles and interferes with tightly coordinated hygiene and production routines. Data from SKF shows:

- 36% of premature bearing failures stem from lubrication issues
- This jumps to 50% when contamination is factored in
- In food and beverage environments, SKF estimates the real-world figure is likely closer to 70%

These numbers highlight the need to rethink lubrication strategy and switch to bearing systems that address contamination at the design level.

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2. Food-safe engineering by design

In food and beverage processing, bearings, lubricants, and housing materials must comply with stringent hygienic and regulatory standards. SKF's Food Line ball bearing units are engineered to withstand aggressive cleaning regimes while maintaining mechanical integrity and contamination resistance.

Key design features include:

- FDA-approved housing materials
- NSF H1 registered food-grade grease
- Food-grade, high-efficiency, low-friction seals
- Hygienic housing geometries compliant with EHEDG standards

These features support effective cleaning and eliminate retention zones where contaminants can collect.



3. Rethinking the need for relubrication

Relubrication is often considered essential in food plants due to harsh washdowns and contamination, but it comes with potential problems:

- Stress on seals and potential for seal failure
- Grease leakage into production areas
- High maintenance costs for labour, grease, and disposal

Loads and speeds are typically low in many food and beverage applications. When combined with effective sealing against environmental contaminants, grease remains effective far longer. SKF Food Line units are sealed for life, eliminating the need for relubrication.

SKF Food Line bearing units are available in a wide range of hygienic housings.



4. Eliminating the root causes of bearing failure

4.1 Ingress of cleaning fluids

Often caustic or acidic cleaning agents contain surfactants that lower surface tension and allow penetration into microgaps. These fluids can bypass standard seals and degrade the grease, causing increased friction and wear.

4.2 High-pressure rinsing

After cleaning, rinsing drives water into the bearing enclosure. Water emulsifies most greases, reducing performance and increasing wear.

SKF addresses these issues through a multi-layered approach designed to protect against both fluid ingress and grease degradation:

- A flinger that rotates with the inner ring, throwing off excess fluids before they can enter the sealing system (fig. 1).
- A gutter seal that closes the sealing system under high-pressure water (fig. 2).
- Channels that guide detergent-laden fluids away from the inner seal (fig. 3).
- A grease formulation that resists breakdown in the presence of caustics and surfactants.

These features protect the bearing from common cleaning-related failure modes, preserve seal integrity, and extend grease and bearing life.

Advanced bearing technologies further enhance performance through:

- Superior seal designs that resist both surfactants and water ingress
- Pre-lubricated, sealed-for-life units that reduce the need for maintenance in cleanable zones
- Corrosion-resistant stainless steels that extend bearing life in wet, chemically aggressive, and high-cleaning environments

Other bearing types in the food line portfolio — including deep groove ball bearings and spherical roller bearings — are also available in food-grade variants with enhanced sealing and grease formulations.

Fig. 1



Fig. 2

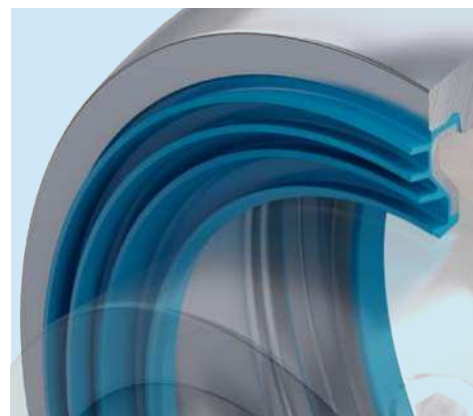
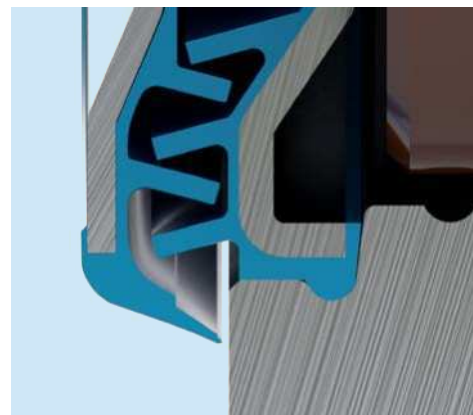


Fig. 3



5. Built for compliance and performance

SKF has steadily expanded its food line bearing and bearing unit portfolio to meet the demands of modern food production. The range now includes deep groove ball bearings, spherical roller bearings, ball bearing units, and compact beverage units.

SKF has evolved its food line portfolio to match the hygiene standards of modern food production. This product evolution reflects a sustained commitment to food safety, operational excellence, and engineering innovation.

The SKF Food Line family



SKF Food Line stainless steel deep groove ball bearing



MRC ultra corrosion-resistant deep groove ball bearing



SKF Food Line deep groove ball bearing for non-corrosive environments



SKF Food Line spherical roller bearings



SKF Food Line ball bearing units



SKF Food Line compact beverage units

6. Strategic impact: Safety, reliability, and sustainability

When the right bearing technologies are used, the benefits ripple across operations:

- **Improved food safety:** Eliminating sources of contamination at the component level.
- **Increased equipment uptime:** Reduced unplanned downtime and fewer maintenance windows.
- **Lower Total Cost of Ownership:** Reduced relubrication, fewer replacements, less waste.
- **Sustainability:** Lower water and lubricant consumption, reduced CO₂ from maintenance activities.

These outcomes don't just improve operations; they elevate brand resilience and competitive differentiation.

Conclusion

The most common causes of bearing failure — ingress of cleaning fluids, water contamination, and grease degradation — are preventable. SKF Food Line ball bearing units solve these critical challenges in hygiene-focused production, improving safety, reliability, and sustainability while lowering maintenance demands.

These units:

- Minimize contamination risk
- Eliminate the need for relubrication
- Reduce water and grease consumption
- Offer long-lasting performance straight out of the box

Contact us to learn how SKF Food Line bearing units can be specified for your hygiene-critical applications.

