

Meat Processing Industry

Background

- At Praxair, we are making our planet more productive. Whether it is by providing industrial gases that are used in the meat processing industry or technologies that allow food processing facilities to reliably meet their wastewater treatment guidelines – Praxair is helping companies improve their productivity.
- The meat processing industry consists of two major groups – slaughterhouses and packinghouses. A slaughterhouse is a plant that harvests animals and whose main product is fresh meat as whole or smaller meat cuts. A packinghouse is a plant that both slaughters and processes fresh meat to cured, smoked, canned and other prepared meat products
- The principal constituents of meat processing wastewaters are a variety of readily biodegradable organic compounds, primarily fats and proteins, present in both particulate and dissolved forms. Meat processing wastewater facilities are faced with a number of challenges in their operations, which could include:



High Fats, Oil, Grease and Suspended Solids loads

Challenge. The volume of water used (per unit of production basis, such as live weight killed (LWK)) can vary substantially (average 4500 l/1000 kg LWK) among processing plants but the wastewater always contains high concentrations of suspended solids (SS) and the contribution of fats, oils, and grease (FOG) to the overall strength of the wastewater stream is very important. Flocculation and coagulation is used to remove these compounds. The amount of coagulant and flocculent to use and the effectiveness of this process are dependent on pH and alkalinity of the wastewater.

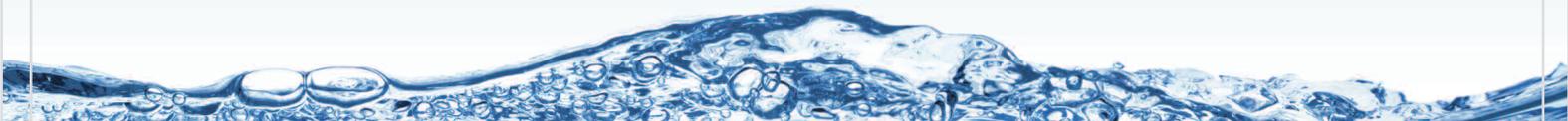
Praxair Approach. Praxair's CO₂ application enables more accurate and easier way to control the pH in the physico-chemical treatment. In some facilities, solids and FOGs removal is achieved using dissolved gas flotation systems where inert gases like Nitrogen (N₂) can be used.

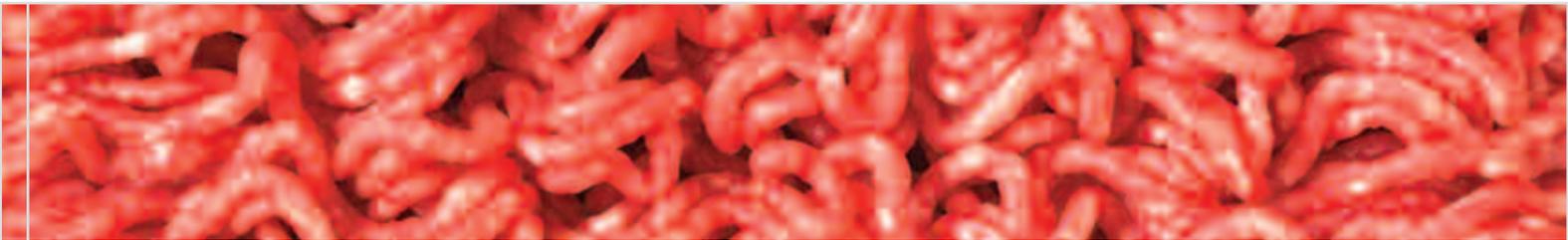


High strength organic loads

Challenge: Uncollected blood, solubilized fat, urine, and feces are the primary sources of BOD in meat processing wastewaters (2-15 kg / 1000 kg LWK). For example, blood from beef cattle has a reported BOD of 156,500 mg/L with an average of 32.5 kg of blood produced per 1,000 kg LWK. Thus, the efficacy of blood collection is a significant factor in determining the amount of BOD in meat processing wastewater. Another significant factor is the manner in which manure (urine and feces) is handled at the facility.

Praxair Approach: High purity oxygen systems enable wastewater facilities to treat up to ten times the organic load that can be treated by a conventional air based system. With our efficient and proven oxygenation systems, mixing and oxygen transfer is decoupled. Providing enough oxygen to meet an increased organic load is as simple as turning up an oxygen supply valve to feed more oxygen to the wastewater process.



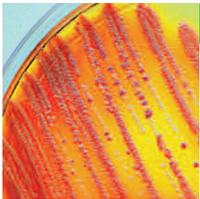


High nitrogen and phosphorous loads

N₂

Challenge: Blood and manure are also significant sources of nitrogen in meat processing wastewaters. The principal form of nitrogen in these wastewaters before treatment is organic nitrogen with some ammonia nitrogen. The phosphorus in meat processing wastewaters is primarily from blood, manure, and cleaning and sanitizing compounds.

Praxair Approach: Pure oxygen devices offer an integral system for reducing organic matter and nitrogen. By allowing for effective nitrification and denitrification, we provide a comprehensive solution for allowing dairy facilities to meet their treatment goals. Using intermittent oxygenation, we enable facilities to utilize a single basin to achieve nitrification and denitrification. The solution is very flexible to changes in flow and composition.



Fecal Coliform Bacteria

Challenge: Total coliform bacteria, fecal coliform, and fecal streptococcus of bacteria are also present in large quantities, due to the presence of manure in meat processing wastewaters. These bacteria are usually present in quantities of several million colony-forming units (CFU) per 100 mL, but are not usually pathogenic. However, they may indicate the possible presence of pathogens such as *Salmonella* ssp, *Campylobacter jejuni*, and gastrointestinal parasites, including *Ascaris sp.*, *Giardia lamblia*, and *Cryptosporidium parvum*

Praxair Approach: Ozone produced using Praxair high purity oxygen is extremely active as a disinfectant. The benefits are the strength of the disinfection and the lack of potentially harmful by-products like trihalomethanes (THMs).



Sludge reduction

Challenge: If the meat processing facility does not have readily available sources for sludge disposal, the disposal of the sludge can be challenging and costly.

Praxair Approach: The patented Lyso™ sludge ozonation process enables wastewater facilities to reduce biological sludge generation by as much as 80%. The use of ozone also provides additional benefits such as enhanced sludge settling in clarifiers, and better sludge dewatering.

Conclusion

- Whether your wastewater treatment system is an extensive aerated lagoon, or a compact wastewater process, our technology offerings will provide you with effective and reliable treatment.
- Praxair's tested and proven wastewater offerings have been extensively deployed in a variety of food processing wastewater operations
- Call us today to discuss your particular wastewater treatment process needs, and let us help you improve your productivity.



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Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113
USA

www.praxair.com
info@praxair.com

Telephone:
1-800-PRAXAIR (1-800-772-9247)
(716) 879-4077

Fax:
1-800-772-9985
(716) 879-2040