EXPLORING EXTENDED USE GLOVES IN THE FOOD INDUSTRY

WHEN COMPARED TO SINGLE-USE AND REUSABLE GLOVES

PROTECTIVE INDUSTRIAL PRODUCTS, INC.
BRINGING THE BEST OF THE WORLD TO YOU®

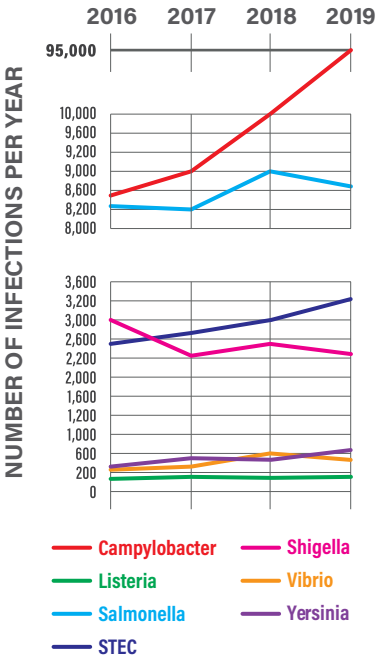
PROTECTIVE INDUSTRIAL PRODUCTS

EVALUATING THE BENEFITS OF

Four Types of Barrier Gloves

In Food Processing Plants

MOST PREVALENT PATHOGENS BY YEAR



INTRODUCTION

This case study looks at the comparison between four types of barrier gloves for precision butchery and trim work in meat processing plants: Single-Use gloves, Extended Use gloves and Reusable gloves in the form of latex "canners" and unsupported nitrile.

CRITICAL PROBLEM

Contamination is the number one risk within the food industry, which includes **foreign material contamination** and **foodborne illness.** The Center for Disease Control (CDC) shows that the major pathogens affecting the U.S. food supply have remained unchanged over several years and the variety of strains tracked by the CDC **continue to infect the public at a rate equal to or higher than they did 10+ years ago.** These microbial outbreaks are preventable through thoroughly followed safety measures and the CDC recommends implementing new strategies using known preventative measures.

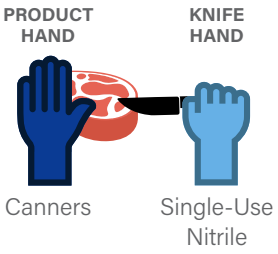
This case study demonstrates that an extended use glove can minimize the exposure of all forms of contamination.

This case study demonstrates that an **Extended Use glove** specifically engineered for food safety can, if properly used, reduce the risk of exposure and contamination through proprietary nitrile blends, superior grip technology, a high AQL (acceptable quality level) rating and a unique design geared toward minimizing all forms of contamination.

This case study is based on the actual experience of a leading global pork processor with plant facilities on four different continents. It will demonstrate how a high-quality Extended Use glove is key in protecting workers and the food supply in the fight against contamination. This is largely made possible with a glove that offers superior grip to decrease slippage, allowing workers to operate more effectively and confidently while also boosting productivity. It will also show the redundancy between the costs associated with a higher quality glove when compared to gloves that may seem outwardly more cost-effective, but in reality, increase company costs through lowered quality and performance which can lead to expensive recalls. Lastly, it will illustrate the cost-related benefits and waste reduction associated with consolidating hand protection under one glove configuration for both the knife hand and the product hand.

THE ANALYSIS

PIP® was contacted by a task force of food safety specialists and third-party quality assurance consultants representing a global pork processing company seeking to consolidate workers' hand protection under new and effective glove technologies. It was explained that after using multiple types of barrier gloves in conjunction with their mesh and knit cut gloves and liners, they continued to experience multiple problems as outlined below.

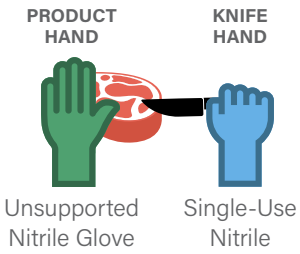


Canners Configuration

REUSABLE GLOVES – LATEX "CANNERS"

The original configuration of hand protection the company used was a common one in the global protein processing industry: On the product hand (the non-dominant hand) was a thermal liner covered by a single-use nitrile glove that was then covered by a metal mesh glove. On the knife hand (the dominant hand) was a knit cut glove covered by a 13 mil latex canner with a raised diamond grip. However, over time, this global processing company observed that canners would swell during use due to degradation from fats and grease, compromising the dexterity and grip of the glove despite the raised diamond pattern. In addition to animal protein being inherently slippery, the compromised performance of the latex material posed a danger during knifework and when operating equipment.

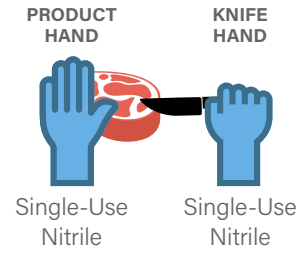
Among worker complaints with thick latex were hand fatigue, improper fit and dexterity, making the product more difficult to handle and slowing production as a result. There were often reports of workers removing their gloves during processing, increasing the potential for injury and cross-contamination. These were backed by numerous complaints about the swelling of some canner gloves after minimal use, most frequently when changing brands to lower cost alternatives. The issues related to canners were proving to be a wasteful liability, with workers using over twice the number of gloves predicted by safety managers during evaluation.



Unsupported Nitrile Configuration

REUSABLE GLOVES – UNSUPPORTED NITRILE

Another test was initiated using unsupported nitrile gloves. Using the same hand protection configuration, the company swapped the canners gloves in favor of an 11 mil unsupported nitrile glove with a raised diamond grip. While the glove was similar to the canner in thickness and design, a nitrile polymer would be more resistant to degradation and swelling against proteins and fats. Though it did have the stated effect, workers started complaining about flexibility and fatigue. Thick nitrile does not have the fit, form and flexibility of latex, causing workers to falter in their knifework while on the line. At the same time, workers' tactile sensitivity was so reduced they found that the grip was no better than that of the canners gloves.



Single-Use Configuration

SINGE-USE GLOVES – DISPOSABLE NITRILE

In an effort to offer workers an alternative to thick, inflexible polymers, the company switched configuration to a 4 mil disposable nitrile glove with textured grip for both the knife and product hands for better handling dexterity and tactile sensitivity. It did not take long for safety managers to determine that the gloves did not have the durability needed for meat processing applications. During the testing it became evident that depending on the quality and thickness of the disposable gloves, some of the lower cost nitrile glove would rip easily and worse — pieces of the glove would tear off and contaminate the production line, causing a halt in operations in order to inspect and retrieve the pieces. It was quickly discovered that low cost meant low quality. Some of the trial gloves with a 4.0 AQL proved to be an issue as workers would not often notice that a glove was defective before joining the line.

With no improvements in contamination or waste control, safety managers found that while workers did report an increase in hand dexterity, the textured grip of the gloves was not secure enough for meat handling and workers did not have confidence in their knifework.

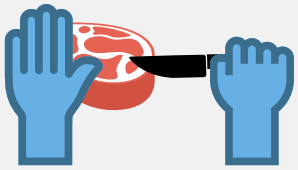
COST/WASTE CONCERNS

Over a period of a year, there were 18,000 employees that used canners, unsupported nitrile gloves and disposable nitrile gloves for pork processing applications. The customer's annual usage for canners gloves was over 14 million pairs, though due to the canners coming in pairs there were approximately **14 million single gloves that were discarded as waste.** This cost amounted to more than $7.6 million annually in addition to the $8.4 million spent on the disposable nitrile gloves used under mesh, for a total of $16 million.

The switch to unsupported nitrile gloves cut the company's usage down to 9.4 million gloves, with half that number being discarded as waste. When including the disposable nitrile used on the product hand, the company went through approximately 51.5 million gloves annually at a total cost of $16.74 million.

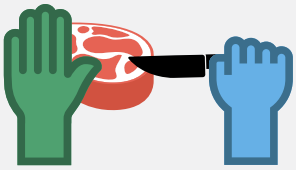
When the customer switched to disposable nitrile, their annual usage was a staggering 93.6 million gloves, which amounted to more than $16.85 million in annual costs. Though considerably less expensive than canners, the disposable gloves were far less durable and overall costs skyrocketed due to defective and torn gloves contaminating the processing line.

ANNUAL GLOVE COSTS
BY YEAR



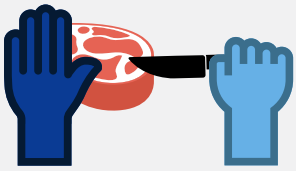
Single-Use Configuration

$16.85M ANNUAL COST



Unsupported Nitrile Configuration

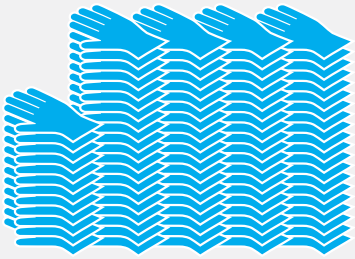
$16.94M ANNUAL COST
$4.68M ANNUAL COST OF WASTE



Canners Configuration

$16M ANNUAL COST
$3.8M ANNUAL COST OF WASTE

GLOVE USAGE
PER YEAR



Single-Use Configuration

93.6M gloves ANNUAL USAGE

Unsupported Nitrile Configuration

51.5M gloves ANNUAL USAGE

4.68M gloves ANNUAL WASTE

Canners Configuration

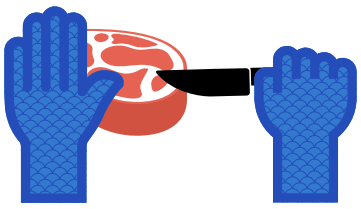
74.9M gloves ANNUAL USAGE

14M gloves ANNUAL WASTE

THE PLAN

The PIP® team specializing in food processing reviewed the needs of the company and determined that canners and single-use gloves fell short on performance based on the grip and durability needed to keep up with production speed. The assessed hazards were related to low dexterity, wet and oily handling and food contamination from torn pieces of disposable gloves getting lost in the production line or workers removing their gloves. An analysis using PIP's Cost-of-Use Calculator evaluated the task requirements, risks and real costs.

In order to reduce contamination and keep workers safe, PIP's recommendation was to opt for an Extended Use glove that offered the dexterity of a single-use glove with the durability of an unsupported nitrile glove while being comparable in cost to both. Grippaz® Food Plus™ 67-308 was recommended for its globally patented fish scale design with internal



The only glove you need for food production, Grippaz® Food Plus™

and external grip pattern, providing superior traction when handling wet, greasy or slippery foods while significantly reducing hand fatigue. The Food Plus™ uses a proprietary nitrile formulation that offers the flexibility and comfort of a single-use glove with the durability of a reusable glove, providing excellent dexterity and degradation resistance against animal fats and proteins. The 8 mil nitrile blend engineered with a rip-stop design resists tears and punctures that could result in foreign material contamination recalls. The thicker mil and flexible, proprietary formulation would allow the Food Plus™ to out-perform single-use nitrile disposables, latex canners and unsupported nitrile gloves in food processing applications, promoting extended use and reduced waste.

TRIAL

The customer agreed to engage in a trial test, outfitting a controlled group of 1000 employees with the Grippaz® Food Plus™ glove on both the cut and non-cut hand. After two weeks it was noted that workers reported better comfortability and easier maneuvering during knifework and equipment operation. It was not long before safety managers were able to see a drop in problems as detailed above, noting that gloves lasted longer and that workers were more likely to keep the Grippaz® gloves on when compared to reusable gloves. Production managers also reported an improvement in daily production goals, which was attributed to workers not having to stop as often to change their gloves and not having to halt production due to torn pieces of glove contaminating the supply line. The improved traction and grip reduced slippage when handling knives and protein, which positively impacted productivity as workers felt more secure and confident in their daily applications.

ADOPTION

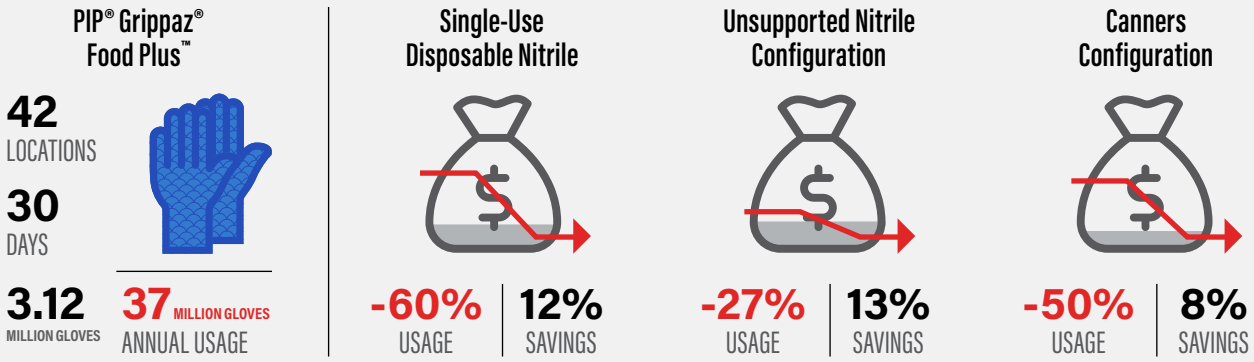
After thirty days of convincing results, the focus turned to a full cost analysis. Safety managers determined that employee breaks aside, one pair of Grippaz® Food Plus™ would be durable enough for workers to use for a full shift or more. When coupled with safety protocol and the average amount of change-outs due to employee breaks, workers used four complete pairs of gloves per day for an average of 1.56 million pairs of gloves per month. When prorated, this volume would be estimated at 18.7 million pairs over a full year for all workers. Compared to disposable nitrile gloves, switching to the Grippaz® Food Plus™ would reduce product usage by over 56 million

pairs per year and the reduced waste benefit put management on track to meet their annual sustainability goals.

When prorating the customer's annual cost with the Grippaz® Extended Use glove, it was calculated they would save 50% when compared to hand protection configurations using canners, and, more than 27% when compared to unsupported nitrile configurations. The savings against disposable nitrile gloves included a calculated cost/risk factor of foreign material contamination, which was common as these single-use gloves would often tear and flake off into the food supply. The direct cost of product recalls puts the overall potential cost of using disposable nitrile gloves at a conservative $10M over the original annual cost of $16.8M. Considering that Grippaz® uses a patented design to prevent foreign material contamination, switching to the Food Plus™ in both instances clearly presents immense savings.

COMPARING USAGE AND SAVINGS

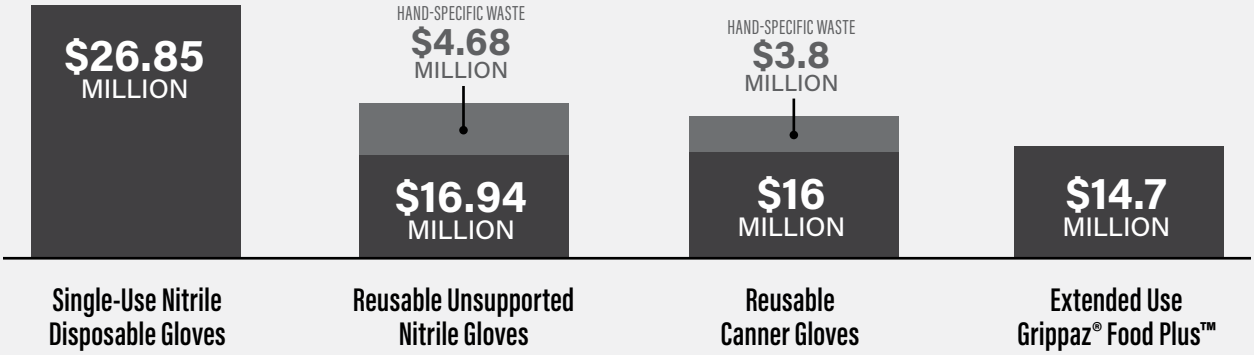
OF PIP® GRIPPAZ® FOOD PLUS™ GLOVE VS. OTHER GLOVE CONFIGURATIONS



Why was the difference so dramatic with an Extended Use glove? The issues presented by reusable and disposable gloves were solved by one product. Workers valued the comfort and dexterity of single-use gloves but found they couldn't hold up to the job in terms of grip, durability and overall protection. They valued the protection offered by canners, but what they gained in durability they lost in comfort and dexterity. The Food Plus™ gave workers the best of both worlds by offering the dexterity and comfort of a light-duty glove with enough horsepower to hold up to the

tough applications in protein processing. Safety managers have predicted that the confidence workers have exhibited with a more secure grip since adopting Grippaz® Food Plus™ gloves may result in fewer cut injuries related to slippage. While the trial was not conducted for a period of time in which to gather sufficient data points, the PIP® team is collaborating with the client to track the overall benefits of Extended Use gloves to better understand how its performance impacts worker safety and culture.

ANNUAL COST OF REUSABLE, DISPOSABLE AND EXTENDED USE HAND PROTECTION



SUMMARY

As we summarize all of the data shared, it becomes easier to see just how impactful it was for this customer to find a better option to disposable nitrile gloves and canners while fostering a more secure safety culture by offering comfortable and durable protection to workers.

With the U.S. Food & Drug Administration's New Era of Smarter Food Safety plan, promoting a positive food safety work culture throughout the entire food system is one of the four core elements aimed at reducing the burden of contamination. Offering Extended Use options like Grippaz® Food Plus™ helps make this process both easier and safer for workers.