Cuts Oil Usage

Remote Heat Fish Fryer Speeds Cooking, Eliminates Hot Spots, Reduces Fatty Acids

Speed of cooking leaves center of fish frozen reducing freezing time

Design & Process Engineering, Inc., Waltham, Mass., has come up with an indirect heat-transfer system for pre-cooking fish which it claims produces a top quality product.

The system uses Monsanto Co.'s Therminol fire-resistant heat transfer fluid.

The fluid is electrically heated to less than 500° F in a remote heater, instead of the 1,500° F common in direct-fired heater tubes.

Pumps carry the heated fluid to stainless steel coils immersed in the frying oil, which is maintained at 400° F, plus or minus 3° F, by a controller which senses the frying oil temperature and adjusts the flow of heat transfer fluid accordingly.

The system also includes a storage-expansion tank vented to the atmospheric pressure.

Advantages

Design & Process Engineering claims several economic and product quality advantages to its system:

- The fish cooks at a higher-than-usual temperature—400° F instead of 360° F so the fish cooks more quickly—in 20 seconds. The coating thus cooks to a uniform golden color. The center of the fish is still frozen, shortening the time necessary in the fast-freezing tunnel, and saving money. More natural moisture is therefore retained, the company claims.
- Despite the higher cooking temperature, hot spots impossible to avoid in direct firing are eliminated. Breading does not burn, the oil remains clean, and fatty acid formation is at a minimum.
- The cooker only requires 225 gallons of oil, less than one-half the capacity of direct-fired units of lesser production capability. Thus, even at minimum production, oil is used up faster than fatty acids form, totally eliminating the need to throw out oil —another considerable dollar saving. The oil is replaced in the cooking process, and the usage itself is less than 6% oil to the weight of the fish, compared to the conventional 10%.

Sea Pass Corp., St. Louis, is sold on the system. I. A. Pass, the firm's secretary, said the system has provided Sea Pass with "tremendous production flexibility. This is particularly vital when going into a new operation."

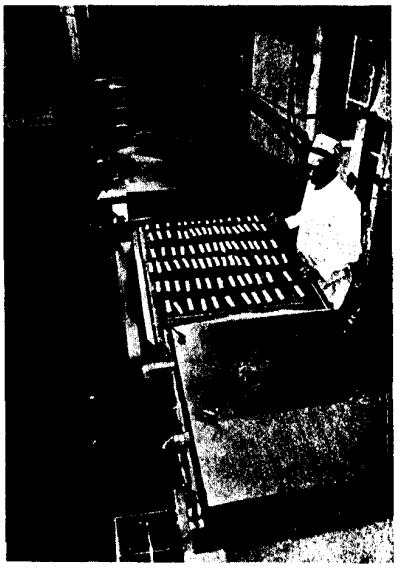
Sea Pass breads and pre-cooks cod, haddock, sole, flounder, halibut, ocean catfish, shrimp, scallops and fish cakes under the Sea Pass label.

"When we decided to set up a cooking facility, we faced an unusual problem because our processing area was tightly enclosed. We felt that a direct-fired cooker would throw too much heat into this area, so we looked for a remotely fired unit. We saw one in operation in the East, liked it, and had a similar unit installed here."

The fryer and over-all control system were supplied by Design & Process Engineering. The Therminol heat-transfer system was supplied by Edwin L. Wiegand Co., Pittsburgh, Pa.

The system's double-filtration of cooking oil is claimed as another factor in maintaining product quality. Oil is filtered constantly during cooking and an auger removes crumbs. The augur and filter areas are relatively cool, again reducing chances of burning and acid formation. The oil is then run through a fine "micron" filter and pumped into a holding tank while the cooker is cleaned.

The over-all processing cycle is slightly more than 15 minutes. Cutting, breading and cooking require less than a minute, a commercially swift period.



Design & Process Engineering cooking equipment at Sea Pass Corp. Fish breading machine is in foreground and fast-freezing tunnel at rear.

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