



NO JOKE—A freezer for Alaskan Eskimos, designed by Arctic Environmental Engineering Laboratory researchers at the University of Alaska, will help natives living on St. Lawrence Island in the Bering Sea preserve their annual walrus

catch during the warm summer months. The freezer building will store up to 100 tons of walrus, refrigerating the meat with a heat sink pool of frozen brine and non-mechanical heat exchanged pumps.
—UA Photo

University of Alaska Engineers Designing 'Icebox' for Eskimos

COLLEGE—Well they're finally doing it.

Engineers at the University of Alaska's Arctic Environmental Engineering Laboratory (AEEL) are designing an icebox for Eskimos.

A refrigerator is no joke to the 400 Eskimos living in Savoonga, an Alaskan village on an island in the Bering Sea. Each year the islanders lose up to half their annual walrus catch—the prime staple of their community—as a result of heat spoilage.

Alaska's extreme climate takes in both ends of the thermometer, bringing warm weather to the arctic during summer months when the midnight sun shines 20 hours or more each day.

To keep the walrus from spoiling, AEEL engineers have found a way to store up winter cold for summer use without any complicated electrical or mechanical equipment.

"Refrigerating the Eskimos' walrus with conventional equipment would cause problems rather than solve them," explained AEEL engineer Phil Johnson.

"If we installed a mechanical refrigeration system in Savoonga, it would be too costly and too

complicated for the Eskimos to maintain because it would require a generator, fuel, and skilled mechanics to keep it operating."

After ruling out the ordinary, Johnson and his team of research engineers at AEEL hit upon a combination of non-mechanical heat pumps and frozen saltwater brine solution to refrigerate a partially buried building with store room for 100 tons of walrus meat.

The Eskimos take nearly 300 walrus each spring when hunting conditions are optimal and the herds move north, following the retreating pack ice.

At present, the village economy loses as much as \$75,000 annually when unrefrigerated walrus meat spoils and cannot be marketed at the going price of 39 cents per pound.

After four months of study, AEEL's engineers are beginning the second phase of their project, financed by a \$32,000 grant from the Economic Development Administration of the U.S. Department of Commerce.

During the next eight months they will construct a working prototype freezer on the UA

campus in order to refine the system and evaluate its components before actually building one at Savoonga on St. Lawrence Island.

Alaskans typically do things in a big way, so AEEL's walk-in Eskimo freezer will be one of the largest buildings in the village.

Imbedded in frozen ground to insulate it from the summer sun, the core of the unit will be a heat sink—a frozen saltwater pool flooding the lower portion of the structure to a depth of four feet.

Perishables will be stored on platforms above the brine-filled basement.

"We can manipulate the freezing point of the water by varying the concentration of salts in the brine solution," Johnson explained. Convection heat exchangers will radiate heat from the building in winter, drawing in cold to freeze the brine which will, in effect, store up cold for use in the summer.

"As the brine thaws in spring, it will cool the walrus meat," Johnson said. "It's as simple as that."

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Heat sink freezers have been used with success across northern Europe, but the concept is as new to this continent as AEEL's modification is to Alaska.

"Once we get it working," Johnson said, "more freezers of this type could be built in other Alaskan villages for \$25,000 or less."

When queried about undermining the perennial jest, Johnson replied, "Everybody but Alaskans used to think it was very funny, and now that Alaskans are finally doing it, we're the ones who are laughing."