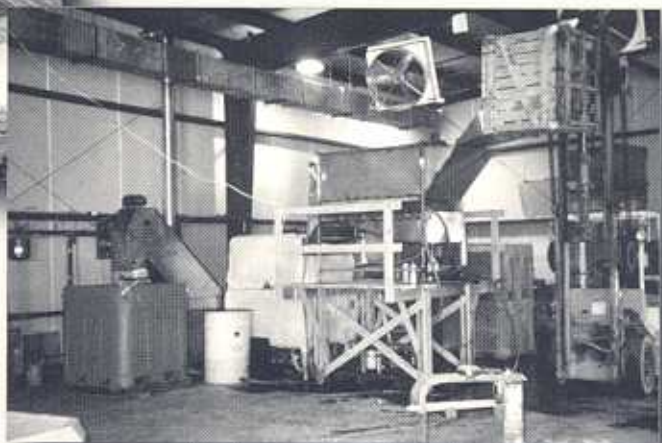


Pickle Pak



SCIENCE

Bulk Storage in Brine Since the 1930's



*A journal reporting
research relating to
brined, salted and
pickled vegetables
and fruit.*



SCIENCE

ABOUT THE COVER:

Bulk storage in brine has been an economic means of extending the processing season of pickling cucumbers since before the 1930's (1). When larger sizes of cucumbers began to constitute a higher proportion of the crop in the 1960's, bloater formation resulted in buoyancy force sufficient to rupture tank heading timbers (2), but purging of CO₂ from the brine reduced bloater damage and buoyancy forces within the tank (3). However, use of high concentrations of salt in brine storage requires washing of the excess from the brine-stock before conversion to finished products, which requires the use of aeration ponds to biodegrade the organic matter (4), but still results in problems in the handling of salt and other non-biodegradable wastes. The use of fiberglass and polyethylene tanks (5) has reduced salt leakage that was prominent with wooden tanks (1-3), but relatively high salt concentrations are still used to serve as insurance against vagaries of nature due to tanks being open to the atmosphere. Closed tanks have been considered by the industry (6), but various factors have resulted in modernized brine yards of open-top, fiberglass and polyethylene tanks and a waste handling system (7). This issue of the journal is devoted largely to summarizing efforts to design and test a pilot system (8) for preserving "process-ready," brined cucumbers with improved quality and reduced wastes, and with intended benefits to the producer and processor of pickling cucumbers.

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**"For Those Who
THINK PICKLES"**

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PREFACE

This issue of *Pickle Pak Science* contains a collection of six papers describing our efforts over the past five years to develop a procedure for producing process-ready, brined cucumbers and other vegetables using bag-in-box technology. The technology has the potential to benefit both farmers (market hedge, value enhancement) and processors (higher and more uniform quality, waste elimination) of brined vegetables.

The first paper describes the pilot system used to preserve process-ready, brined cucumbers. By process-ready we mean the use of a sufficiently low concentration of salt to preserve the cucumbers, but not so high as to generate wastes created when excess salt must be washed from the brine-stock before their manufacture into finished products. The cucumbers are removed from the brine, briefly washed to remove bacterial cells, and incorporated into finished products. The brine is filtered and used as an acidulant for fresh-pack and other products. The paper on brine membrane filtration (#4) and the one on sensory quality of pickles using this brine (#5) explain how this new technology can be applied by the pickle industry.

The paper on predicting equilibrium temperatures of blanched/brined cucumbers (#2) can be useful in several heat transfer applications to the pickle industry, in addition to optimizing the conditions for bag-in-box technology. Conditions affecting storage stability of bag-in-box brine-stock are given in paper #3. The use of preservatives to preserve brined vegetables without fermentation is given in paper #6.

Thus, this collection of papers is intended as an introduction to a potential new era for the preservation of brined vegetables. The technology for this new era will require a careful cost analysis to determine if the savings in waste elimination, improved product quality/uniformity, and greater security from contamination are sufficient to offset the expenses involved in implementing the new technology.

In addition to the above six papers, two other papers are included in this issue. One relates to the use of hydrochloric acid to acidify brines in traditional, commercial bulk tanks of cucumbers to an optimum pH of 3.5 for microbial and textural stability. The other paper relates to the use of an air-lift pump to move brine-stock pickles in a commercial operation.

Henry P. Fleming

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