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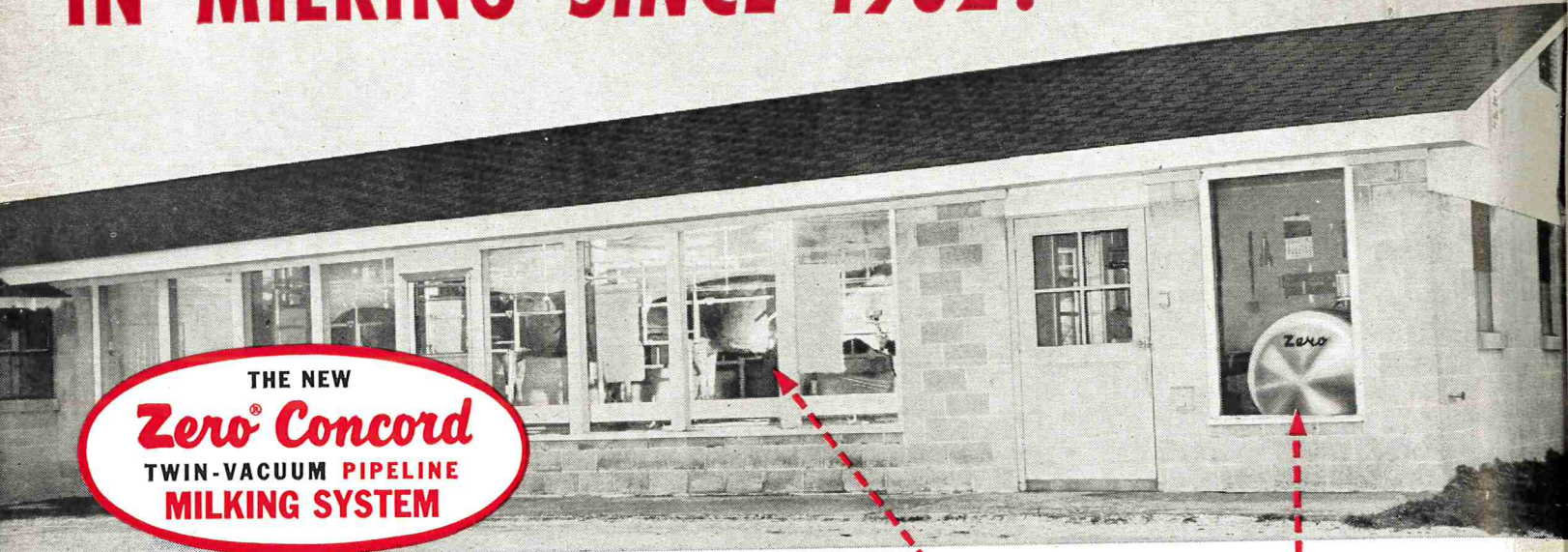
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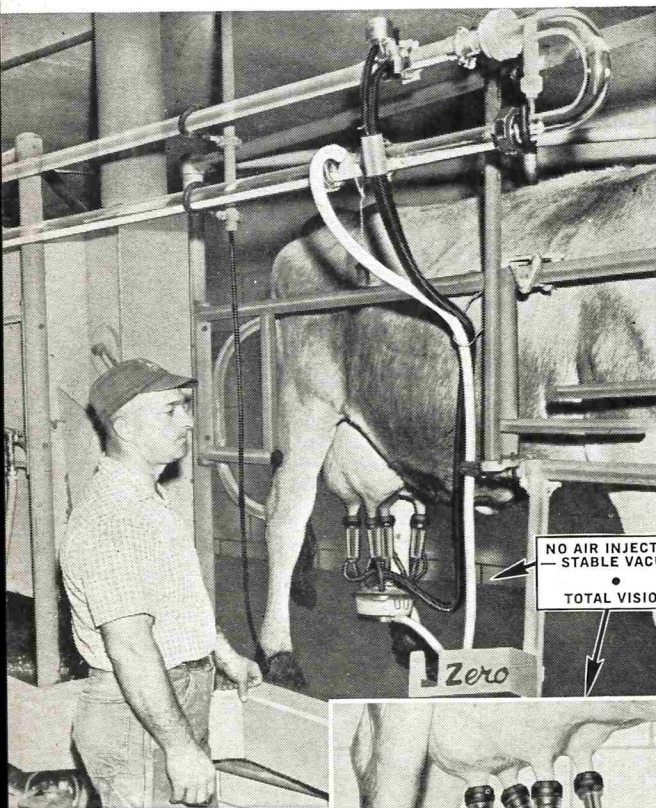


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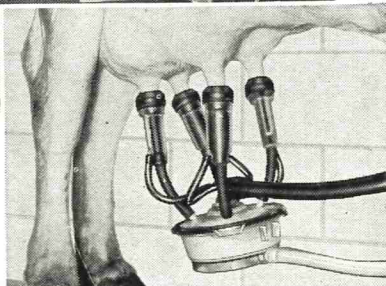
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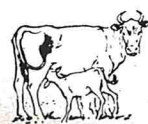
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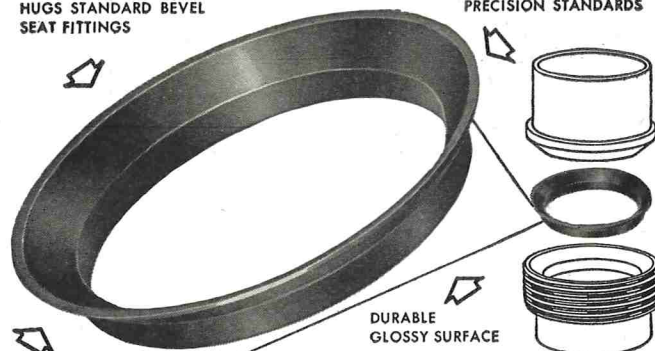
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September, 1967

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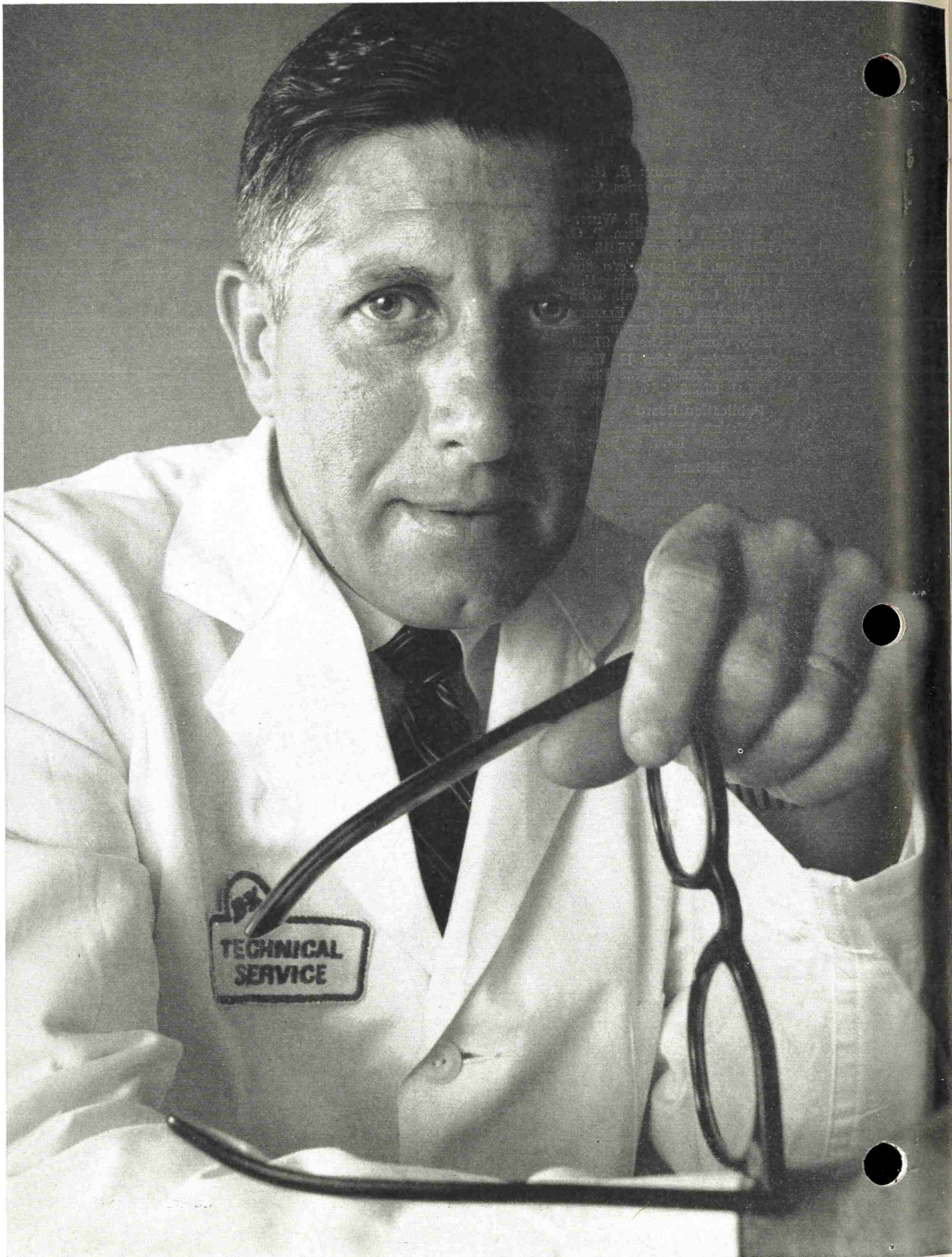
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# THE USE OF THE 0.01 ML LOOP IN THE PLATE LOOP METHOD FOR MAKING VIABLE COUNTS OF MILK<sup>1</sup>

D. I. THOMPSON

*Wisconsin State Laboratory of Hygiene<sup>2</sup>,  
Madison, Wisconsin 53706*  
and

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*National Center for Urban and Industrial Health  
Public Health Service, Cincinnati, Ohio 45226*

(Received for publication May 9, 1967)

## SUMMARY

A plate loop count method for determining viable counts of pasteurized milk products is described. The technique uses a 0.01 ml calibrated platinum alloy loop attached to a continuous pipetting syringe for rinsing the 0.01 ml of sample into a petri dish with 1 ml of sterile buffered dilution water prior to pouring with agar. Results with this method indicate that accuracy within  $\pm 15$  percent is attainable on samples of skim, 2 percent, homogenized, whole milk, and half and half. Measurements of chocolate milk were not accurate.

The plate loop count (PLC) method using a 0.001 ml calibrated loop has been used for determining viable counts of raw milk since it was introduced by Thompson, Donnelly and Black (7) in 1960. Approved milk laboratories in at least half of the states are now using the PLC on raw milk samples.

The principle of using a loop for measurement was reported by Burri (2) in 1928 for inoculating agar slants in making viable counts of milk. Robertson (4) found wide variations in making replicate measurements of the same sample with the same loop.

It now seems possible to attain acceptable accuracy and uniformity in measuring milk volumes with a calibrated loop. The authors (7) showed close comparisons between the standard plate count (SPC) and PLC methods on Grade A raw milk when a 0.001 ml loop was used. Tatini, Dabbah and Olson (6) found good agreement between the SPC and PLC only when the counts were equal to or less than 100,000 per ml when the 0.001 ml loop was used on manufacturing grade raw milk.

Experience by the authors in Cincinnati, Ohio, and in Wisconsin in evaluating milk laboratories has shown that the speed of loop withdrawal is critical in obtaining accuracy with the PLC. Jasper and

Dellinger (3) showed that a 0.01 ml loop can be used accurately for making milk smears if the loop is removed vertically from the sample at the correct speed.

In this report, the use of a 0.01 ml calibrated loop attached to a continuous pipetting syringe is described for making viable counts of pasteurized milk. The accuracy of this method is determined by comparing replicate PLC platings with replicate platings of the Standard Plate Count (SPC) on specially prepared test samples as well as by weighings of samples adhering to the loop.

## MATERIALS AND EQUIPMENT

The equipment used for the PLC (0.01 ml) differs from the original PLC method in several ways other than loop size: The cannula is 14 gauge with a longer barrel. The wire shank attached to the loop is inserted into the barrel of the cannula with the loop extending straight out from the end of the barrel. No bend is placed in the exposed portion of the shank. This design permits a more forceful rinsing of the loop.

(a) Loop, true circle of No. 19 B & S gauge welded platinum-rhodium wire 4 mm inside diameter attached to a 50 mm wire shank (Arthur H. Thomas Co., Cat. No. 7433-A<sup>3</sup> or equivalent). A slight bend is placed in the wire shank to hold it in place when inserted in barrel of cannula. It is essential that the loop have a smooth weld and be free rinsing.

(b) Cannula, 14 gauge Becton-Dickinson No. 1250 NR sawed off about 60 mm from point where barrel enters hub.

(c) Cornwall continuous pipetting outfit, adjustable, 2 ml size, Becton-Dickinson No. 1251.

The above parts are assembled in the following manner:

The wire shank of the loop is inserted into the barrel of the cannula to a point where the center of the loop extends about 18 mm from the end of the barrel as shown in Figure 1. The luer-lok hub is attached to the luer-lok fitting on the Cornwall continuous pipetting outfit. This apparatus is sterilized by autoclaving for 10-15 minutes at 121 C or by submerging parts in boiling water for 10 minutes. The loop and shank may be flame sterilized.

Optional equipment: metronome, Seth Thomas or equivalent.

<sup>1</sup>Work on this project was initiated while the senior author was on active duty as an army reserve officer at the Robert A. Taft Sanitary Engineering Center. The experiments were completed at the Wisconsin State Laboratory of Hygiene, Madison.

<sup>2</sup>Official laboratory for the Wisconsin State Board of Health.

<sup>3</sup>Mention of commercial products does not imply endorsement by the Public Health Service.

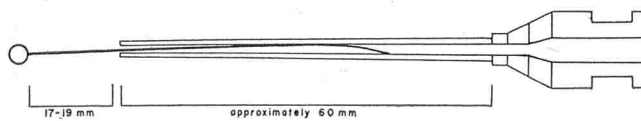


Figure 1. Loop and wire shank attached to the sawed off cannula.

#### EXPERIMENTAL PROCEDURE

Figure 2 shows the assembled 0.01 ml transfer and measuring instrument ready for use. The end of the rubber supply tube attached to the syringe is placed in a bottle of sterile, phosphate-buffered dilution water (5). The syringe plunger is depressed rapidly several times to pump the water into the glass syringe. Squeezing the rubber tubing near the valve between the thumb and forefinger intermittently while pumping the plunger hastens priming. The syringe is adjusted to

deliver 1 ml of sterile buffered dilution water with each depression of the plunger. Care is taken to have the loop positioned in the barrel of the cannula so the water flows rapidly directly across its center.

In examining a series of samples and before initial transfer is made, the loop is briefly flamed, preferably in a clean, high temperature gas flame and cooled with a stream of sterile dilution water by depressing the plunger. The loop is carefully dipped into the milk sample 3 times (avoiding foam) to 1-2 mm above the loop. The loop is withdrawn *vertically* from the surface of the sample (see Figure 3). The water droplet that comes off the loop during the initial dip is avoided by moving the loop to a different location on the surface of the sample for the final withdrawal. The movement is a *uniform* up and down movement of about 1.5 inches.

The speed of the final withdrawal governs the amount of product adhering to the loop. Each upward movement is made at the speed of 55-65 beats per minute. Removing the

TABLE 1. REPLICATE WEIGHTS (MILLIGRAMS) OF VARIOUS MILK PRODUCTS ADHERING TO A 0.01 ML CALIBRATED PLATINUM ALLOY LOOP

	Skim	2%	Homo	½ & ½	Chocolate milk	Lab. past. whole milk
Brand A	11.2	8.9	9.8	12.3	13.7	9.9
	10.2	9.7	8.7	10.1	12.4	11.1
	11.0	10.2	8.9	10.8	14.5	12.6
	8.9	10.2	10.5	11.0	15.7	10.3
	10.3	11.3	9.8	11.1	15.7	11.4
	10.4	10.1	12.4	10.4	15.2	12.0
	10.0	10.2	13.2	9.9	15.5	9.3
	10.5	11.7	10.4	9.9	14.5	10.9
Mean	10.3	10.3	10.5	10.7	14.7	10.9
Coefficient of Variation	6.8%	8.5%	15.1%	7.5%	7.8%	10.0%
Brand B	12.3	9.9	8.4	11.4	16.5	9.7
	10.7	10.8	9.2	9.3	16.4	11.1
	10.7	9.6	10.1	11.5	15.1	8.6
	9.8	10.3	9.3	10.4	16.5	10.7
	11.7	10.6	9.6	11.2	16.6	11.0
	11.4	10.0	10.3	9.0	17.2	10.9
	10.5	12.2	10.5	10.8	16.8	9.1
	10.2	10.5	9.8	10.0	15.4	9.8
Mean	10.9	10.5	9.7	10.5	16.3	10.1
Coefficient of Variation	7.6%	7.6%	7.0%	9.0%	4.3%	9.4%
Brand C	10.3	10.1	8.8	11.4	13.5	9.9
	10.7	9.8	9.0	10.2	11.0	11.3
	12.1	9.6	10.4	12.1	11.3	10.5
	11.3	9.1	9.6	10.2	12.5	10.2
	11.9	10.4	11.6	11.4	12.4	9.2
	12.3	11.7	11.2	10.9	16.1	9.6
	10.4	10.8	11.1	12.1	15.5	9.0
	12.6	10.7	9.7	10.9	15.1	10.9
Mean	11.5	10.3	10.2	11.2	13.4	10.1
Coefficient of Variation	7.8%	7.9%	10.4%	6.7%	14.6%	8.0%

TABLE 2. COMPARISON OF SPC AND PLC REPLICATE PLATINGS OF THREE SPECIALLY PREPARED TEST SAMPLES (COLONIES PER PLATE)

	Sample 1		Sample 2		Sample 3	
	SPC 1:100	PLC	SPC 1:100	PLC	SPC 1:100	PLC
	102	109	143	89	102	103
	100	91	104	113	117	129
	111	93	103	109	130	115
	102	110	100	95	130	117
	97	92	110	84	114	108
	110	91	118	102	120	115
	116	109	117	96	114	101
	112	94	102	98	133	138
Mean	106	97	112	98	120	116
Variation from SPC		-8.5%		-12.5%		-3.3%
Coefficient of Variation	6.0%	9.0%	12.8%	9.9%	8.8%	10.8%

loop slowly causes less than 0.01 ml to adhere. Jerking the loop out rapidly causes more than 0.01 ml to adhere. A metronome may be used to establish uniform timing. Samples are plated by raising the cover of the petri dish and rinsing the sample into the dish by depressing the plunger of the syringe causing water to flow rapidly across the center of the loop (see Figure 4).

The accuracy and uniformity of the loop measurement was determined by use of a Mettler (Type B) balance. The weight of the dry loop was subtracted from the weight of the loop dipped in the various milk products. The dipping technique described previously was followed carefully. Replicate weighings were made for each product.

The accuracy and uniformity of the loop was also checked by making replicate PLC and SPC plates on specially prepared test samples. Fresh samples of raw whole milk were collected on separate days from large storage tanks and pasteurized in the laboratory. These samples were inoculated with a pure culture of bacteria to obtain approximately 100-140 colonies on the 1:100 dilution.

Control plates were made to test whether or not the loop was free rinsing. These were made by discharging a loopful of various milk products from the loop followed by flushing the discharged loop again into a second petri dish. The plates were poured with Standard Methods agar and incubated 48 hours at 32 C.

## RESULTS

Eighteen samples of pasteurized milk products were collected over a period of several weeks. The products were from major dairy companies, plus three laboratory-pasteurized whole milk samples. Eight replicate weighings were made of each sample for a total of 144 weighings. The mean weight and coefficient of variation for each sample was determined. The approximate weight of 0.01 ml of the non-chocolate products was calculated to be 10.3 mg. Chocolate milk was estimated to weigh 10.6 mg per 0.01 ml. The results of actual weight determinations are shown in Table 1. The means of all of the non-

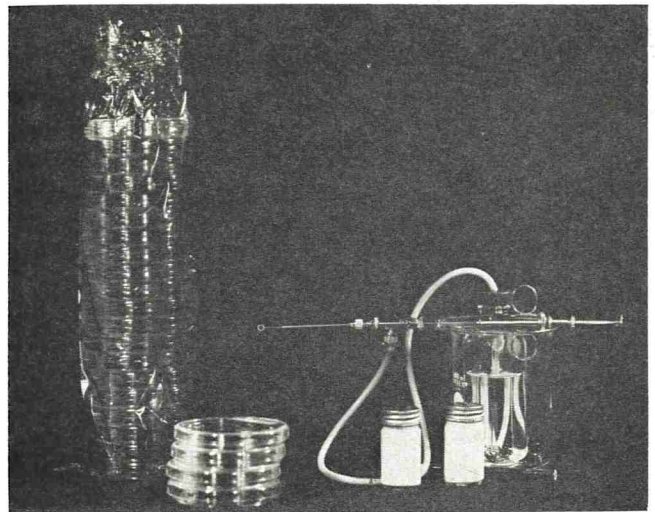


Figure 2. Transfer and measuring instrument assembled and ready for use.

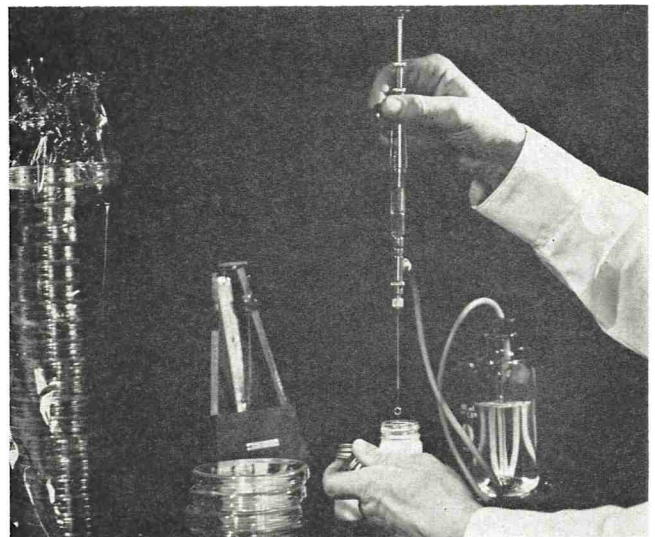


Figure 3. Loop being dipped into milk vertically. A metronome may be used to establish accurate technique. Good illumination is essential.

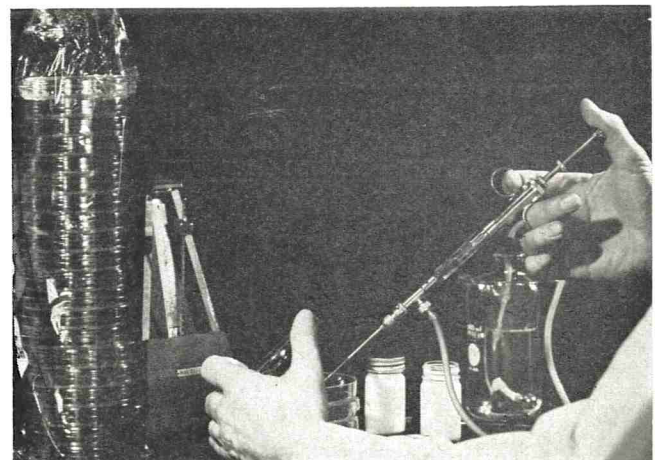


Figure 4. Washing the 0.01 ml milk sample into the petri dish.

chocolate products fell well within  $\pm 15$  percent of the 10.3 mg expected. Only sixteen of the 120 individual weighings of non-chocolate products fell outside the  $\pm 15$  percent range. The coefficients of variation for all products were less than 10 percent in all but three of the eighteen samples. The weights of chocolate milk indicate that excessive amounts of this product adhere to the loop.

Three test samples were used to compare the PLC with the SPC. Eight replicate plates were made with the loop method and eight replicate plates were made with the 1:100 dilution. The mean count and coefficients of variation were determined. These results are shown in Table 2. The means of each method were well within  $\pm 15$  percent of each other in all three trials. The coefficients of variation indicated acceptable uniformity.

Control plates (rinse) were made after discharging relatively more viscous chocolate milk as well as non-chocolate products from the loop. The samples contained at least 100 colony-producing bacteria per 0.01 ml. None of the total of 50 plates contained more than one colony.

#### DISCUSSION

One of the items of concern in adapting the 0.01 ml loop to the PLC was the rinsing characteristic of the loop. Control plates indicate that smoothly-welded loops are free rinsing, and flaming between samples should not be necessary.

Analysts may check their proficiency by making replicate weighings on an analytical balance or by making replicate PLC and SPC plates on test samples. Mean weights within  $\pm 15$  percent of 10.3 mg are attainable. PLC means within  $\pm 15$  percent of SPC means are likewise attainable. The coefficients of variation should not exceed 15 percent.

If inaccurate results are experienced, several causes

of error may be checked: The correct speed of withdrawal is of major importance and may be established by use of a metronome set at about 55-65 beats per minute. The angle of withdrawal should be  $90^\circ$  to the liquid surface and the distance of the up and down movements should be uniform (about 1.5 inches). The depth to which the loop is submerged should be 1-2 mm.

Further work will be needed to determine the suitability of using the 0.01 ml loop adaptation of the PLC or similar measuring devices (1) for making official viable counts of milk. The results of the 0.01 ml loop measurements warrant consideration by future APHA committees for inclusion of this method in Standard Methods for the Examination of Dairy Products.

Industry laboratories may find the method described here useful for routine control purposes.

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# THE EFFECTIVENESS OF EDTA AS A FISH PRESERVATIVE<sup>1</sup>

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## SUMMARY

A concentration of 0.005% Na<sub>4</sub>EDTA markedly inhibited the growth of the facultative psychrophiles *P. putrefaciens*, *P. Fragi* and *P. fluorescens* in half strength nutrient broth at pH 7.0. *Achromobacter lipolyticum* was the only psychrophilic organism of 20 tested which was found to be insensitive to EDTA. The application of a 1.0% dip of Na<sub>4</sub>EDTA to haddock fillets for 1 min failed to suppress the increase in bacterial numbers on fillets stored at 3 C when compared to untreated control fillets. Refrigerated storage at 3 C was, however, extended by the dip from 5 to 9-10 days based on odor and taste evaluations. The formation of trimethylamine and volatile basic nitrogen was markedly suppressed in EDTA dipped fillets.

In an effort to develop an agar growth medium for the maximum enumeration of the bacterial flora on fish (13) sodium citrate was added as one of several carbon and energy sources assessed. The presence of 0.2 to 0.5% sodium citrate at pH 7.0 in a complex nutrient agar medium was found to markedly reduce the number of developing colonies when compared to control media without sodium citrate. When fresh haddock fillets were dipped for one minute in 1.0% sodium citrate no preservative effect was noticed on storage at 3 C. The possibility that the application of a non-nutrient chelating agent such as EDTA might effectively suppress spoilage of refrigerated fillets was then investigated.

## MATERIALS AND METHODS

**Microorganisms.** The culture of *Pseudomonas fluorescens* used was obtained from W. E. Sandine (Department of Microbiology, Oregon State University). This culture yielded true exponential growth curves at 23.5 C using OD measurements, but produced cell clumps when grown at 3 C preventing the measurement of low temperature growth from optical density determinations. *Achromobacter lipolyticum* and *Achromobacter butyricum* were obtained from the stock culture collection of this department. Other facultatively psychrophilic cultures used in this study were *Pseudomonas putrefaciens* ATCC 8071, *Pseudomonas fragi* ATCC 4973 and fifteen unidentified organisms isolated from fish and capable of growth at 3 C. These cultures were allocated to the genera *Achromobacter*, *Pseudomonas*, or *Micrococcus* according to the scheme of Shewan et al. (9).

**Growth rate studies.** All growth rate studies were performed using 48 ml of half strength nutrient broth in 250 ml Erlenmeyer flasks which were inoculated with 2 ml of actively growing cultures. For studies at 23.5 C flasks containing various concentrations of Na<sub>4</sub>EDTA adjusted to pH 7.0 with 1N HCl were inoculated and incubated on an Eberbach variable speed reciprocating shaker model 75-698 set at 120 oscillations per min. Growth rates at 3 C were determined with a New Brunswick Metabolyte Water Bath Shaker model G77 set at a speed control reading of 3 and equipped with a New Brunswick refrigeration unit model XG77-R25.

**Plate counts.** Plate counts on fillets stored at 3 C were performed by blending 30 g fish for 2 min in 270 ml of broth consisting of 0.2% yeast extract (Difco), 0.2% trypton (Difco), 0.2% glucose, 0.25% NaCl; in distilled water at pH 7.0. Serial 1:10 dilutions were performed in broth and plated in duplicate using broth as above plus 1.5% agar.

**Trimethylamine (TMA) assay.** One-hundred gram samples of fish were blended with 200 ml of 7.5% trichloroacetic acid (TCA) for 2 min and the method of Dyer (2) used.

**Volatile basic nitrogen.** Two milliliters of the TCA extract used for the TMA assay were subjected to steam distillation after adding 1 ml of 50% NaOH to the sample chamber of the distillation vessel. The collection flask contained 5 ml of .0357 N H<sub>2</sub>SO<sub>4</sub> and 200 ml of CO<sub>2</sub> free distilled water. Six-hundred milliliters of distillate were collected and titrated with .0357 N H<sub>2</sub>SO<sub>4</sub> using 0.5% alcoholic methyl red as indicator (14). Results were reported as milligrams volatile basic nitrogen per 100 g fish tissue.

**EDTA assay.** A modification of the method of Darbey (1) was used as follows: 100 g fish were blended with 200 ml of 7.5% TCA for 2 min and filtered; 10 ml of extract were removed and made up to 50 ml with distilled water in a 250 ml Erlenmeyer flask; 15 ml of 1.33% (w/v) aqueous NiSO<sub>4</sub> was added and allowed to stand 10 min; 5 ml conc NH<sub>4</sub>OH were added and allowed to stand 10 min; 15 ml of 1.5% (w/v) dimethylglyoxime were slowly added down the side of the flask, allowed to stand 10 min and filtered through a 0.45 micron millipore membrane filter beneath a 60 micron porosity glass fiber pre-filter disk; 60 ml were transferred to a 250 ml Erlenmeyer flask, 3.5 ml conc HCl added and allowed to stand 5 min; 0.010 g potassium dithiooxalate was then added and the optical density read against a distilled water blank after 1 min using one-half inch square glass cuvettes in a Bausch and Lomb Spectronic 20 colorimeter at 510 millimicrons. Milligrams of Na<sub>4</sub>EDTA per 50 ml sample solution were read from a standard curve (Figure 1) and converted to milligrams Na<sub>4</sub>EDTA per 100 g of fish.

**Sensory evaluation.** All fillets studied had the head and tail sections removed before treatment and storage to obtain center sections of uniform quality (7). A trained panel of six to ten judges was used throughout. Odor evaluation was performed with the fillet tissue upward and skin down using a 9 point scale similar to that used by Shewan et al. (10). Each panelist was asked to place a check beside the appropriate odor description for each sample fillet evaluated and to also

<sup>1</sup>Presented at the eleventh annual Atlantic Fisheries' Technological Conference at Point Pleasant, New Jersey on September 28, 1966.

TABLE 1. EFFECT OF 0.1% Na<sub>4</sub>EDTA ON THE GROWTH RATES<sup>a</sup> OF FACULTATIVELY PSYCHROPHILIC BACTERIA AT 3 C

Culture	Genus	Growth rate in absence of EDTA	Growth rate in presence of 0.1% Na <sub>4</sub> EDTA
A57	<i>Achromobacter</i>	55.7	D <sup>b</sup>
3C	"	21.2	D
A18S	"	44.1	D
A13	"	11.0	24.8
A30	<i>Pseudomonas</i>	21.1	38.4
A37LG	"	25.2	41.0
A35	"	34.5	D
6	"	13.2	34.8 <sup>c</sup>
9A	"	14.9	25.1 <sup>c</sup>
A51	"	15.6	44.8 <sup>c</sup>
A47	"	14.2	39.2
A1	"	8.7	21.2
A20	<i>Micrococcus</i>	19.3	D
A45	"	16.4	D
A18LG	"	11.5	23.2
<i>P. fragi</i>		15.7	— <sup>d</sup>
<i>A. butyricum</i>		9.2	49.7
<i>P. putrefaciens</i>		16.8	71.8
<i>A. lipolyticum</i>		26.9	26.9

<sup>a</sup>Growth rates expressed as generation time in hours.

<sup>b</sup>D signifies an immediate decrease in OD without growth.

<sup>c</sup>Indicates slight increase in OD followed by cessation of growth at low population density followed by a decrease in OD.

<sup>d</sup>—indicates no change in OD.

TABLE 2. MEAN ODOR SCORES ASSOCIATED WITH CATEGORIES OF ODOR ACCEPTANCE

Fillets	Acceptable		Questionable		Not acceptable	
	mean	SD <sup>a</sup>	mean	SD	mean	SD
EDTA treated	6.9	1.5	5.4	1.8	2.3	1.6
Untreated	6.7	1.9	4.6	1.5	2.3	1.4

<sup>a</sup>One standard deviation from the mean.

TABLE 3. MEAN FLAVOR SCORES ASSOCIATED WITH CATEGORIES OF FLAVOR ACCEPTANCE

Fillets	Acceptable		Questionable		Not acceptable	
	mean	SD <sup>a</sup>	mean	SD	mean	SD
EDTA	7.7	1.4	5.3	1.3	3.8	1.5
Untreated	8.1	1.4	4.6	0.5	2.8	1.7

<sup>a</sup>One standard deviation from the mean.

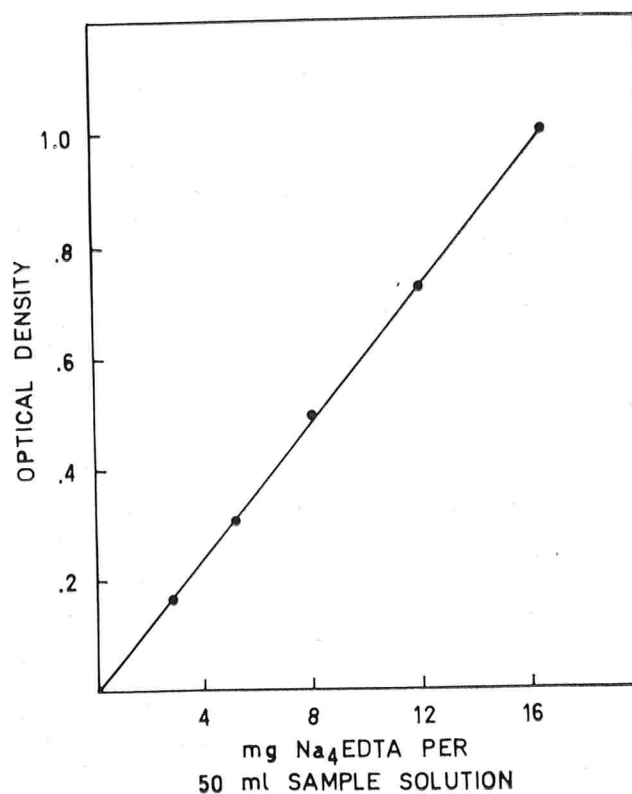


Figure 1. Standard curve for EDTA assay.

designate the degree of acceptance for each fillet (acceptable, questionable, or not acceptable).

Flavor evaluations were performed, using a ten point scale similar to that used by Shewan et al. (10) on fillets steamed for 25 min in a double boiler and served at 145 F. Flavor acceptability was also designated for each sample. The mean values for all odor and flavor scores respectively were calculated for the three categories of acceptance (acceptable, questionable, not acceptable) and the standard deviation from the mean for each degree of acceptability determined (Tables 2, 3).

## RESULTS

*Inhibition of bacterial growth by EDTA.* The influence of EDTA on the growth of facultatively psychrophilic fish spoilage bacteria at 23.5 C is illustrated in Figure 2, 3, and 4. With all three pseudomonas cultures the growth rates were markedly suppressed by 0.005% Na<sub>4</sub>EDTA. In contrast to the three pseudomonas cultures *Achromobacter lipolyticum* was notably insensitive to the presence of EDTA. The growth rate of this organism was completely unaffected by 0.1% Na<sub>4</sub>EDTA and failed to be suppressed by as much as 0.5% EDTA until after 4.5 hr of growth. The effect of 0.1% Na<sub>4</sub>EDTA on the growth rates at 3 C of 19 facultatively psychrophilic cultures showed *A. lipolyticum* to be insensitive (Table 1); six cultures experienced an immediate and continuing decrease in OD upon inoculation; three cultures showed only slight growth followed by a decrease in OD;

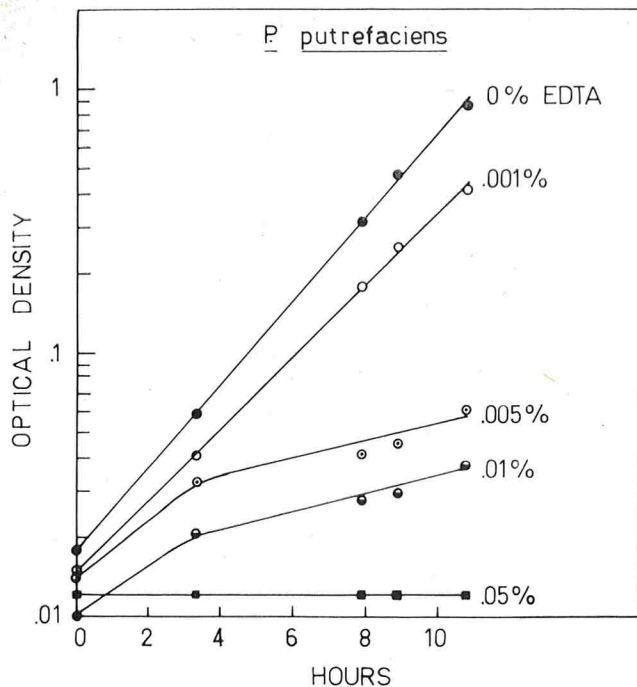


Figure 2. Growth of *Pseudomonas putrefaciens* at 23.5 C in half strength nutrient broth plus various concentrations of  $\text{Na}_4\text{EDTA}$  at pH 7.0.

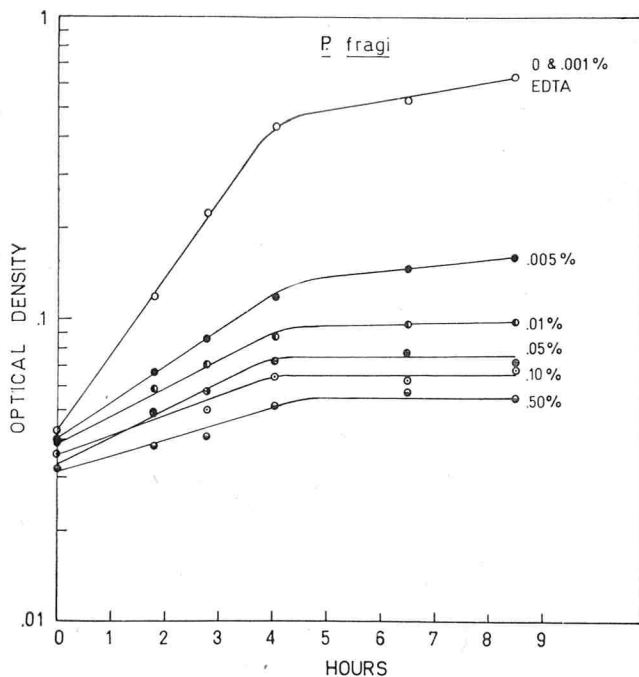


Figure 3. Growth of *Pseudomonas fragi*. See Figure 2 for experimental details.

the OD of one culture remained constant from the time of inoculation, and the growth rates of nine cultures were significantly retarded.

*Preservative effect of  $\text{Na}_4\text{EDTA}$  on haddock fillets.* Fillets of recognized high quality were dipped in 1%

$\text{Na}_4\text{EDTA}$  for 1 min. wrapped and sealed individually in polyethylene bags and stored at 3 C. Untreated control fillets were dipped in distilled water and similarly wrapped and stored at 3 C. Fillets were periodically removed from cold storage at two day intervals unless otherwise noted and evaluated by the panel for odor and flavor, and subjected to chemical and bacteriological analysis. The mean value for "not acceptable" odor scores was 2.3 for both EDTA treated and untreated controls with a standard deviation of 1.6 for EDTA treated fillets and 1.4 for control fillets (Table 2). A score of 3.9 for EDTA treated and 3.7 for control fillets representing one standard deviation from the respective means was used to indicate rejection by the panel. The untreated control fillets (Figure 6) reached an odor rejection score of 3.7 after 6 days storage at 3 C while the EDTA treated fillets did not reach the odor rejection score of 3.9 until the tenth day. The data in Figure 7 were obtained using a batch of fish of slightly higher quality as evidenced from the zero time odor scores. Untreated fillets were rejected after five days refrigerated storage while EDTA treated fillets were not rejected until the tenth day of storage.

The rate of decrease of flavor scores (Figure 8) for EDTA treated and untreated fillets differed considerably after the first three days of storage. A score of 5.3 (3.8 + 1.5) for EDTA treated fillets and 4.5 (2.8 + 1.7) for the untreated controls, representing one standard deviation from the respective means was used to indicate rejection by the panel (Table 3). The untreated fillets were rejected on the fifth day of storage at 3 C while the EDTA treated fillets were not rejected until the ninth day of storage.

*Influence of EDTA on chemical and bacterial in-*

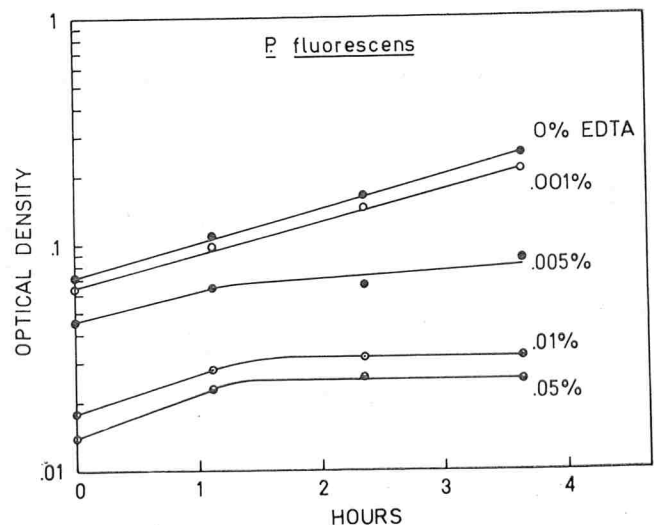


Figure 4. Growth of *Pseudomonas fluorescens*. See Figure 2 for experimental details.

dices of spoilage. Dipping fillets for 1 min in 1%  $\text{Na}_4\text{EDTA}$  completely prevented TMA production during the first seven days of storage at 3 C (Figure 9). After the seventh day a gradual increase in TMA occurred. The untreated fillets in contrast, rapidly reached a maximum TMA value on the sixth day.

The formation of volatile basic nitrogen in treated fillets was completely suppressed, during the first five days of refrigerated storage, followed thereafter by a gradual increase (Figure 10). The untreated fillets differed by rapidly increasing in volatile basic nitrogen, reaching a maximum value on the eighth day.

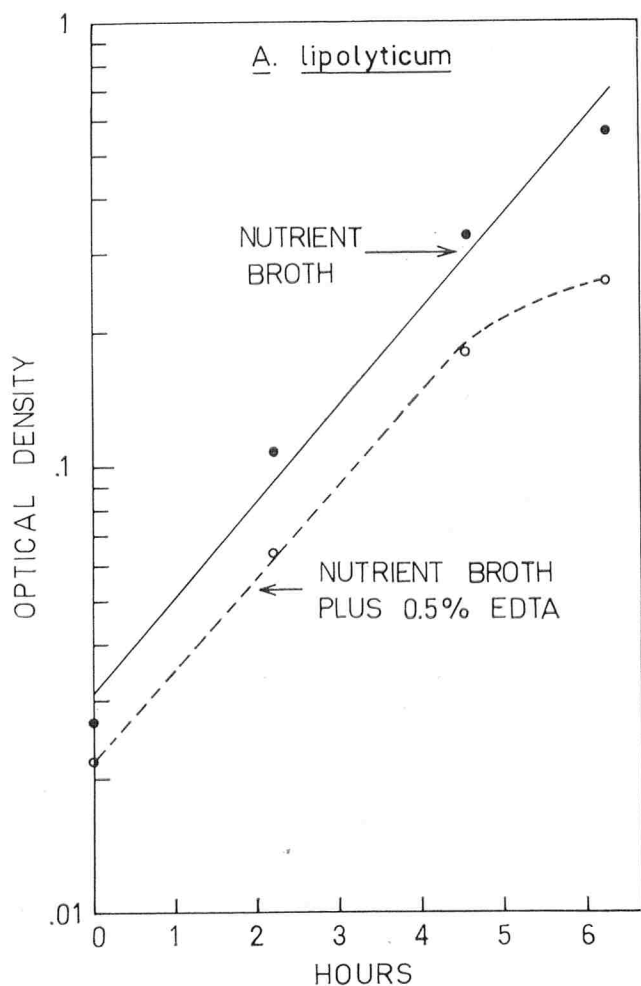


Figure 5. Growth of *Achromobacter lipolyticum*. See Figure 2 for experimental details.

From the observations on growth rate inhibition (Table 1 and Figure 2, 3, and 4) and the pronounced retardation of TMA and volatile basic nitrogen formation in EDTA treated fillets (Figure 9, 10) one is led to assume that an increase in the bacterial count on treated fillets should be notably retarded during refrigerated storage. The rate of increase of the total bacterial population on fillets was found, however,

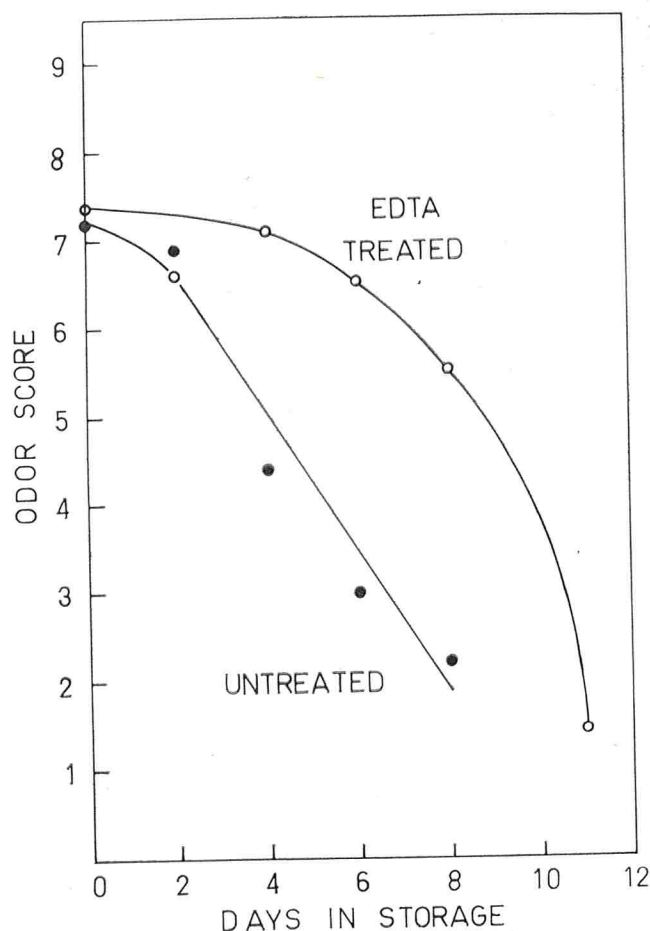


Figure 6. Decrease in odor scores of haddock fillets dipped in 1.0%  $\text{Na}_4\text{EDTA}$  for 1 min. then stored at 3 C and of untreated fillets dipped for 1 min. in distilled water and stored at 3 C.

to be unaffected by the presence of EDTA (Figure 11), with no obvious shift in predominating spoilage species on treated fillets. The initial residual EDTA on dipped fillets was 0.28% (Figure 12) and as succeeding days of storage followed this decreased to a relatively constant value of 0.18% due most accountably to initial drop off during the first four days of storage.

#### DISCUSSION

The destruction and inhibition of bacterial cells by chelating agents is well recognized (2, 8, 12). Gray and Wilkinson (5) observed that EDTA at an alkaline pH selectively solubilized a high proportion of the carbohydrate and phosphorous present in the cell walls of a number of gram negative bacteria resulting in a decrease in turbidity of cell wall suspensions. EDTA is known to be bactericidal for *Pseudomonas aeruginosa*, 0.0001M destroying over 99.99% of the cells in suspension (5) and 250 ppm destroying 99.999% (6). Repaske (8) treated cells with Dowex-50, a ca-



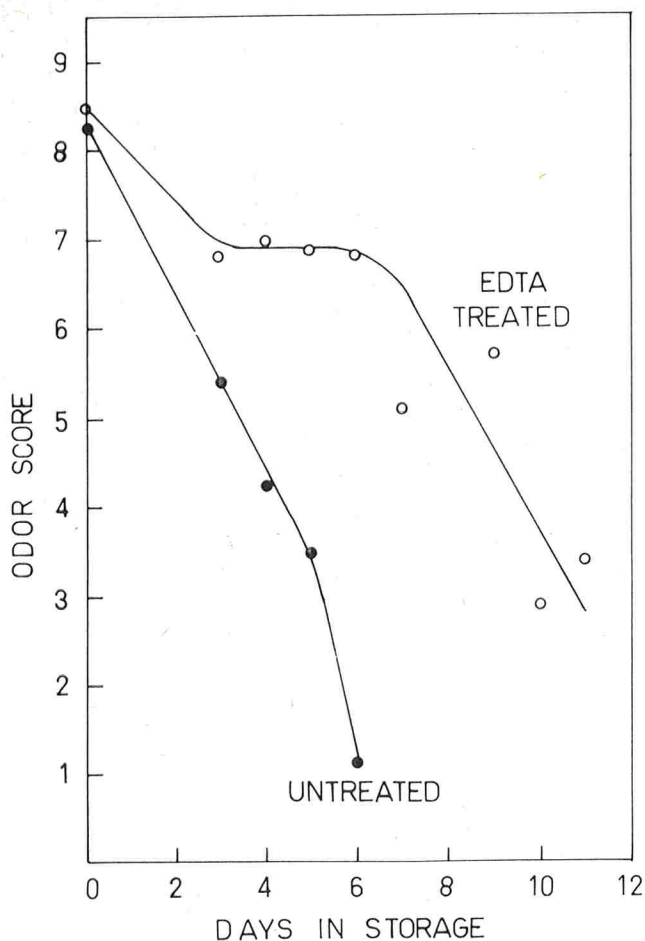


Figure 7. Decrease in odor scores of haddock fillets. See Figure 6 for experimental details.

tion exchange resin, which resulted in lysis of *Azotobacter vinelandii* and *Escherichia coli* B. and concluded that lysis by  $\text{Na}_4\text{EDTA}$  results from removal or chelation of a metal. Goldschmidt and Wyss (4) found that vegetative cells and cysts of *A. vinelandii* were insensitive to EDTA unless tris buffer was present. These authors also found that the presence of any one of 11 nitrogen compounds including  $\text{NH}_4\text{Cl}$ , urea, and cystine-HCl potentiated destruction of azotobacter cysts by EDTA. They attributed the toxicity of EDTA in the presence of such chemical agents to complexes formed between EDTA and nitrogen compounds. Such chelation complexes between EDTA and nitrogen compounds in fish tissue may possibly retard their enzymatic degradation and also prevent transport of such substrates into spoilage bacteria. Bacterial growth without rapid spoilage might then occur as a result of direct inhibition of exocellular bacterial spoilage enzymes by the binding of required cations or by the binding of specific tissue substrates of spoilage enzymes by EDTA. The percent of *P. putrefaciens* and *P. fluorescens* of the total spoilage flora on EDTA

dipped and non-dipped fillets was not notably different. The exocellular enzymes of *P. putrefaciens* have been found markedly sensitive to EDTA (in progress) accounting in part for the retarded spoilage of EDTA treated fillets even in the presence of large numbers of the organism. Although the major portion of the contaminating population on EDTA treated fillets grew unabated it is to be expected that at least a minor population of the flora was eliminated or retarded. The pronounced insensitivity of *A. lipolyticum* to EDTA in contrast to the rapid decrease in OD experienced by some cultures indicates a fundamental difference in cell wall composition and metabolism and lends credence to the possibility suggested by Shively and Hartsell (11) that sensitivity to EDTA may possibly be used as a taxonomic tool.

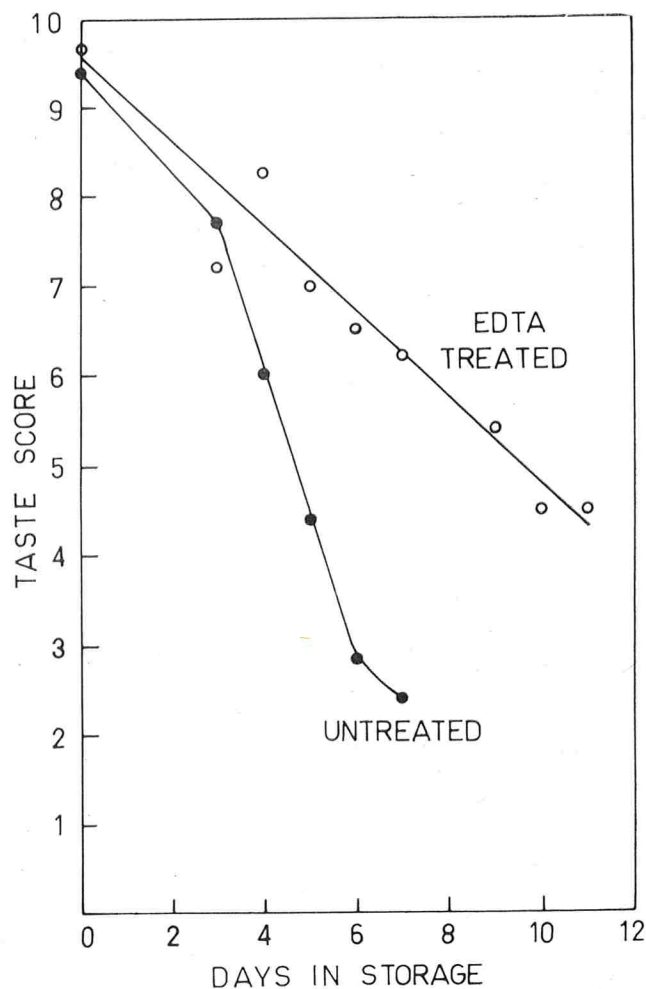


Figure 8. Decrease in taste scores of haddock fillets. See Figure 6 for experimental details.

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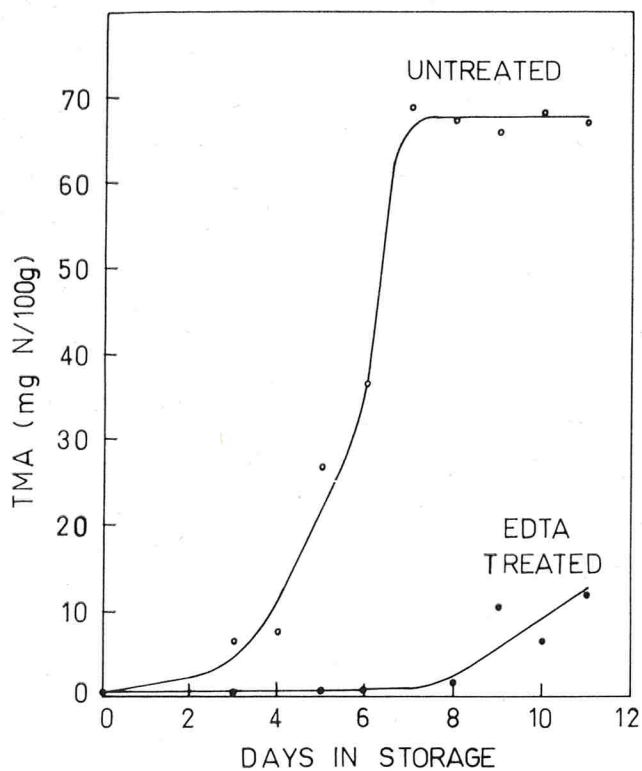


Figure 9. Increase in TMA in EDTA treated and untreated haddock fillets. See Figure 6 for experimental details.

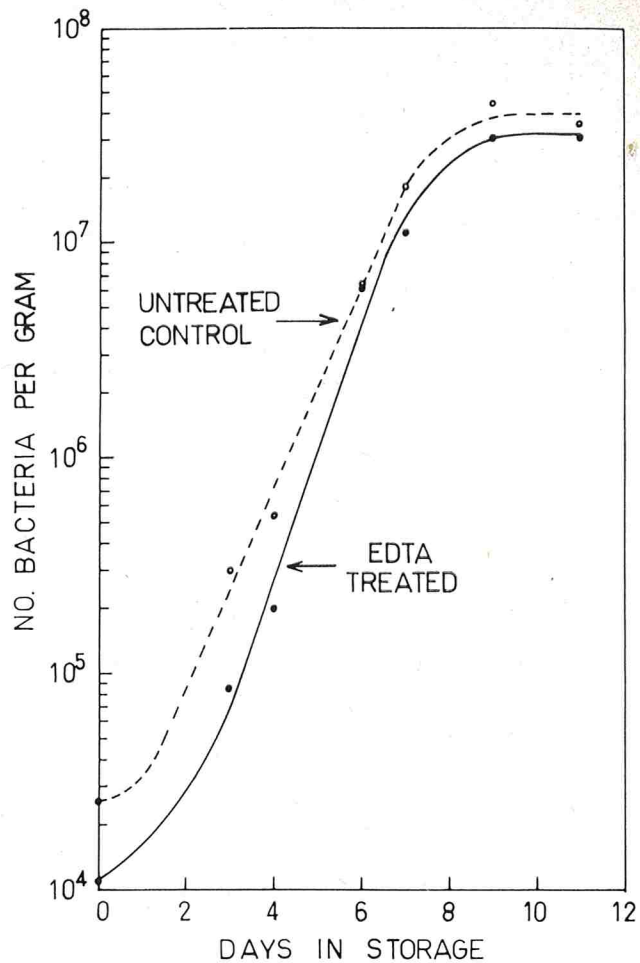


Figure 11. Increase in bacterial numbers on a single EDTA treated and a single untreated fillet. See Figure 6 for experimental details.

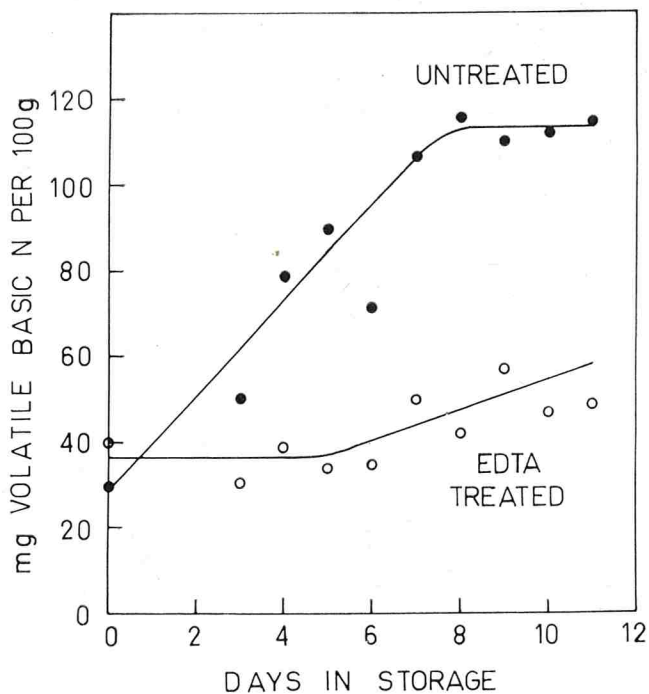


Figure 10. Increase in volatile basic nitrogen in EDTA treated and untreated haddock fillets.

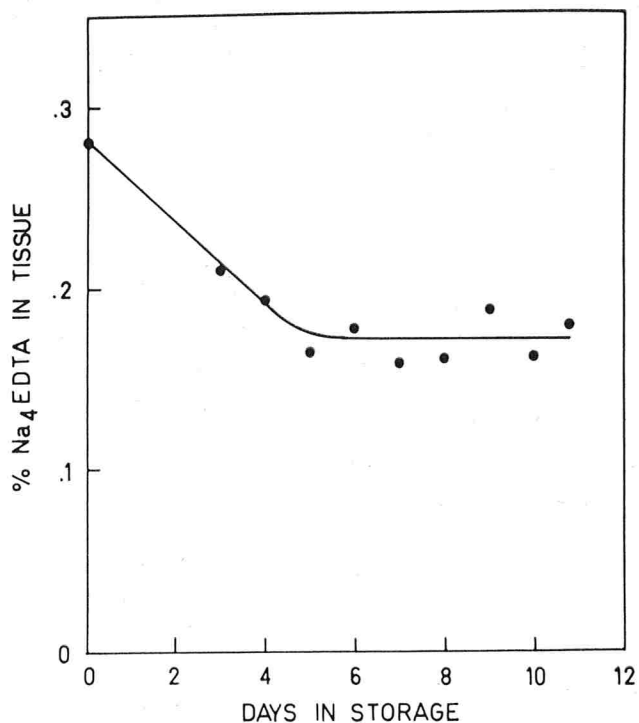


Figure 12. Residual Na<sub>4</sub>EDTA remaining on dipped fillets during storage. See Figure 6 for experimental details.

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### MILK ADULTERATION 75 YEARS AGO

The following item first appeared under the heading "Milk Adulteration" in the June, 1892, issue of the *Journal of the American Medical Association*. It was reproduced in the 75 Years Ago column in the June 26, 1967, issue.

At its last meeting the Chicago Medical Society discussed the subject of milk inspection. There is no official supervision of the Chicago milk supply, and in consequence much of the milk delivered to consumers is either watered, or skimmed or both. When Chicago is making strenuous efforts to improve its water supply, and the people are constantly urged to boil the lake water before using it, it seems strange, almost criminal, that so important a loophole as the milk supply is left open. It is not to be supposed that dealers who are sufficiently dishonest as to water milk will take the trouble to boil the water before they put it into the milk. At least none of them have as yet claimed this redeeming feature. It is well known that typhoid fever has been transmitted by means of water milk. Watered milk is therefore a direct menace to the health of the community, and the most careful family, in the absence of a thorough system of

milk inspection, is unable to guard itself fully from danger from this source.

A specimen of a milk-expanding compound was exhibited to the members of the Society. This substance, when added to watered milk, makes it resemble pure milk quite closely, in both taste and appearance. It therefore permits a greater dilution of the milk with water than would otherwise be possible without easy detection of the fraud. In fact, milk which has been diluted with four or five times its bulk of water, may be made to pass inspection by the addition of a small quantity of this substance. Last fall at the instance of the State Board of Health of Michigan, Prof. F. G. Novy, of the University of Michigan, analyzed this substance, that is presumably this same substance, as it was a mixture sold for the purpose of making milk, and found it to consist of a thick solution of cane and invert sugars, with a little salicylic acid, and salts, of which common salt made up the bulk. This substance is sold openly in Chicago as a milk preservative. "Milk expansion" is the most dangerous form of milk fraud that has yet been detected, and there is reason to believe that it is quite extensively employed in the city of Chicago, and probably also in other large cities of the country.

## FIFTY-FOURTH ANNUAL MEETING OF IAMFES

AUGUST 13-17, 1967



Dr. Paul R. Elliker delivers Presidential Address at 54th Annual Meeting of IAMFES.

The Florida Affiliate Association sponsored the 54th annual meeting of IAMFES held at the Americana Hotel, Miami Beach, Florida, August 13-17, 1967. While other meetings of IAMFES have been better attended, none were better organized and more smoothly run. Everything possible was done to provide an enjoyable and meaningful annual meeting for those attending.

The Executive Board sessions began Sunday. The principal item on the agenda was a thorough discussion of progress to date and future planning relative to a possible merger of the activities of the International Association of Milk, Food, and Environmental Sanitarians (IAMFES) and the National Association of Sanitarians (NAS). These are the two largest Sanitarians Associations. It has become evident in recent years that the aims and objectives of IAMFES and NAS overlap to a considerable degree. There has been a growing feeling among both memberships that combining the activities of the two Associations might better serve the interests of the Sanitarian.

At the opening session Tuesday morning, President Elliker devoted a major portion of his address to out-

lining and discussing events to date relative to a possible IAMFES-NAS merger. He included a rather detailed discussion of a proposed draft of a Constitution and By-Laws for a new organization. Dr. Elliker's address appeared in the August issue of the Journal. Readers are referred to this paper for further information.

Attendance at the technical sessions, evening discussion sessions, and the business meetings was especially good. This undoubtedly was a reflection of the interest in the subject matter on the program. Almost all of the papers presented will appear in future issues of the Journal.

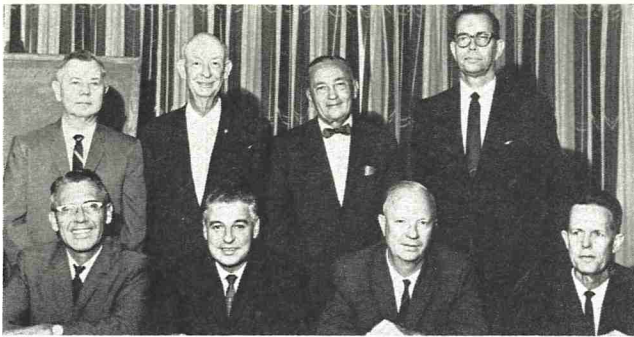
The Affiliate Council meeting held Monday evening was an unusually active session. President Elliker and the Executive Board were on hand to give the Council a firsthand report of progress being made in combining the activities of the IAMFES and NAS. He reviewed in detail the latest draft of the Constitution and By-Laws of a proposed new organization of Sanitarians. Many questions arose and for the most part were resolved. This was evidenced by the vote of confidence extended to the Executive Board of the Association relative to their efforts toward the merging of the two national Associations.

Other matters were considered by the Council. In recognition of the difficulty Journal Editors have in obtaining news of activities of Affiliate Associations for publication in the Journal, a strong recommendation was made that each Affiliate set up a mechanism for more effective communication between it and the Association offices in Shelbyville.

Sanitarian registration plans came in for considerable discussion by the Council. With the several registration plans in effect, many Sanitarians are confused and undecided as to which one would be most advantageous. If objectives of the various plans are duplicated or conflicting, there would appear need for resolving any problems created thereby.

The Association Committee structure was felt by several Council representatives to be in need of strengthening from the standpoint of providing for broader representation of Affiliate Associations. It was felt that while the size of committees was large enough, frequently perhaps too large, there was on the other hand need for better geographical representation on committees.

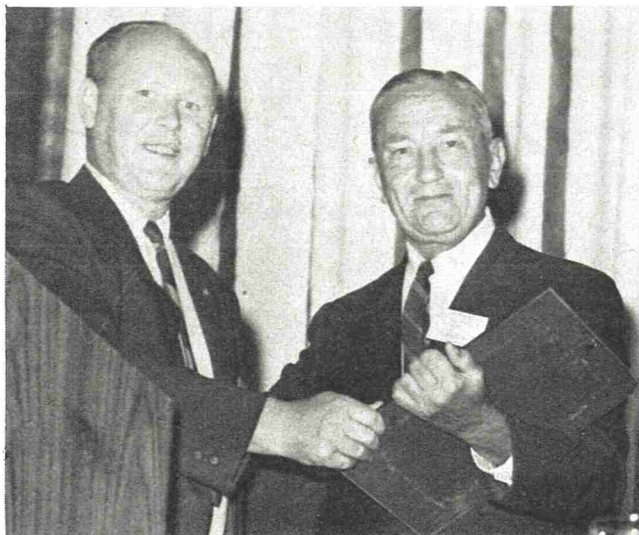
The present officers of the Affiliate Council consisting of Erwin P. Gadd, *President*, and L. Wayne Brown, *Secretary-Treasurer*, were reelected.



Newly elected IAMFES Executive Board, (Bottom row left to right) Sam Noles, Pres.-Elect; Al Myhr, President; Dr. Paul R. Elliker, Junior Past Pres.; Karl K. Jones, Secretary-Treasurer; Milton Held, First Vice-Pres.; "Red" Thomasson, Exec-Sec'y.-Mg. Ed. (ex-officio); Fred Uetz, Senior Past-Pres.; Dick B. Whitehead, Second Vice-Pres.

Preceding the annual banquet Wednesday evening, members and guests were hosted at a cocktail party sponsored by the Local Arrangements Committee. An old friend and long-time member of International, Dr. Howard Wilkowske, Assistant Director of the Florida Agricultural Experiment Station, and formerly Secretary-Treasurer of IAMFES was Master of Ceremonies. Following the award ceremonies, the "young in heart" stayed on and enjoyed the dancing and dance music of the fine eight piece orchestra provided through the courtesy of the Local Committee.

The Sanitarian's Award and accompanying check for one thousand dollars was awarded to Roger L. Stephens, Chief Sanitarian, City Health Department, Logan, Utah. William V. Hickey of the Paper Cup and Container Institute and Past President of the Association was the recipient of the Association's Citation Award in recognition of his meritorious con-



Fred Uetz, Senior Past President receives Presidential Award.

tributions to furthering the aims of the Association.

Dr. Luther A. Black, who recently retired from his position as Chief, Milk Sanitation Research, R. A. Taft Sanitary Engineering Center, Public Health Service, was honored by the Association through election to Honorary Life Membership. Dr. Black is a former recipient of the Association's Citation Award.

Honorary Life Membership was also awarded to Mr. C. A. Abele, Director of Public Health Research for the Diversey Corporation, Chicago. Mr. Abele is an Association Past-President and has long served the organization on committee activities, particularly as Chairman of the Committee on Sanitary Proced-



Norman Tobey (left) receives Special Award Plaque from T. H. DeLaney, President of the Florida Association of Milk and Food Sanitarians, for his outstanding work as chairman of the Local Arrangements Committee.

ures, a post he held for a number of years. He is presently Secretary-Treasurer of the 3-A Symbol Council.

Neither Dr. Black nor Mr. Abele were able to be present at the International meeting this year. The award to Mr. Abele was accepted on his behalf by Mr. A. K. Saunders, a fellow Chicagoan and the award to Dr. Black was accepted by Richard Brazis, U.S.P.H.S., Cincinnati, Ohio.

The formal activities during the annual banquet program closed with the installation of officers for the coming year. Dr. Allan N. Myhr, Professor, Department of Dairy Science, Ontario Agricultural College, Guelph, Ontario, was installed as *President* by outgoing *President*, Dr. Paul R. Elliker. Mr. Dick B. Whitehead, Southern District Manager, Klenszade Products Division, Economics Laboratory, Inc., was announced as elected to the office of *Second Vice*

*President.* Dr. Elliker also announced the reelection of Karl K. Jones as *Secretary-Treasurer*. The *President-Elect*, *First Vice President*, and *Second Vice President* advance automatically to offices of *President*, *President-Elect*, and *First Vice President*, respectively.

Therefore, the Executive Board of the Association now is as follows: *President*, Dr. Allan N. Myhr; *President-Elect*, S. O. Noles, Florida State Board of Health, Jacksonville; *First Vice President*, Milton E. Held, Regional Milk and Food Consultant, U. S. Public Health Service (HEW), San Francisco; *Second Vice President*, Dick B. Whitehead; *Junior Past-*



Past Presidents table at Annual Meeting banquet (left to right) Jack Fritz, Franklin Barber, C. K. Johns, Ivan Parkin, Ray Belknap, Bill Hickey, "Red" Thomasson and Mrs. Franklin Barber adds a touch of glamour.



Mrs. Irene Thompson, Co-Chairman of Ladies Activities (seated on table) chats with some IAMFES ladies.

*President*, Dr. Elliker; *Senior Past-President*, Fred E. Uetz, The Borden Company, New York; and *Secretary-Treasurer*, Karl K. Jones. The presentation of the Past-President's Plaque was made to Fred E. Uetz. In an informal ceremony which has almost become traditional, a gavel was presented to newly installed President Myhr by W. V. Hickey who made the presentation on behalf of the Public Health Committee of the Paper Cup and Container Institute.

An interesting and entertaining ladies program was set up by the Local Arrangements Committee, opening with a get-acquainted Coffee Hour on Monday morning for the early arrivals. Tuesday the ladies



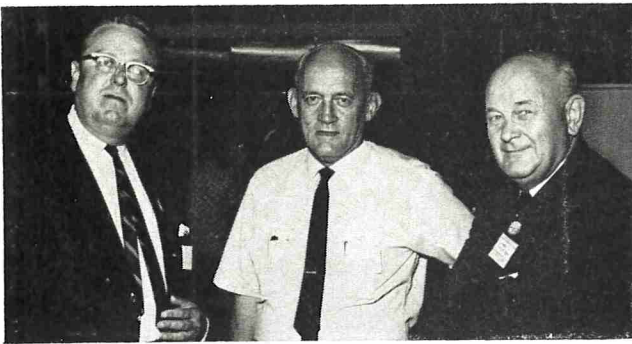
Registration Committee at work.



T. H. DeLaney, President of Florida Association samples products from Dairy Bar courtesy of Home Milk Producers Association.



Members at General Session of Annual Meeting.



Verne Nickel and C. W. Dromgold, from St. Louis, Missouri have Art Parker, from Portland, Oregon, in the middle.

took a trip by boat to the Miami Seaquarium. This was a leisurely boat ride through the inner bay to view the magnificent and palatial island homes and other sights worth seeing. They returned by bus through downtown Miami.

Wednesday afternoon they were entertained by a wig show and demonstration. Throughout the convention many of the ladies took advantage of the splendid patio garden facilities of the hotel for sunbathing sessions or a dip in the fresh water pool. Some of the slightly more rugged enjoyed surf bathing in the ocean adjacent to the hotel.

While a resolution expressing appreciation for the work of the Local Arrangements Committee was adopted at the business session, a special word of thanks is due the Committee for the smoothness and lack of complications with which the convention was conducted. Facilities and arrangements were excellent and Norman N. Tobey, General Chairman and all of his section chairmen and committee members deserve a hand of applause for their efforts during the year prior to the convention and their handling of affairs of the program.

International's 55th Annual Meeting is scheduled for the Chase-Park Plaza Hotel, St. Louis, Missouri and the dates are August 18-22, 1968. Mr. John Schilling, St. Louis Health Division, General Chair-



IAMFES members relax and have a friendly visit at Annual Meeting.

man of the Local Arrangements Committee was present at the Miami Beach meeting and promises equally fine accommodations and facilities for the 1968 convention. The sponsoring affiliate, of course, is the Missouri Association of Milk and Food Sanitarians.

Our Thanks To The  
CONTRIBUTORS TO THE  
1967 I.A.M.F.E.S. CONVENTION  
BAL HARBOUR, FLORIDA

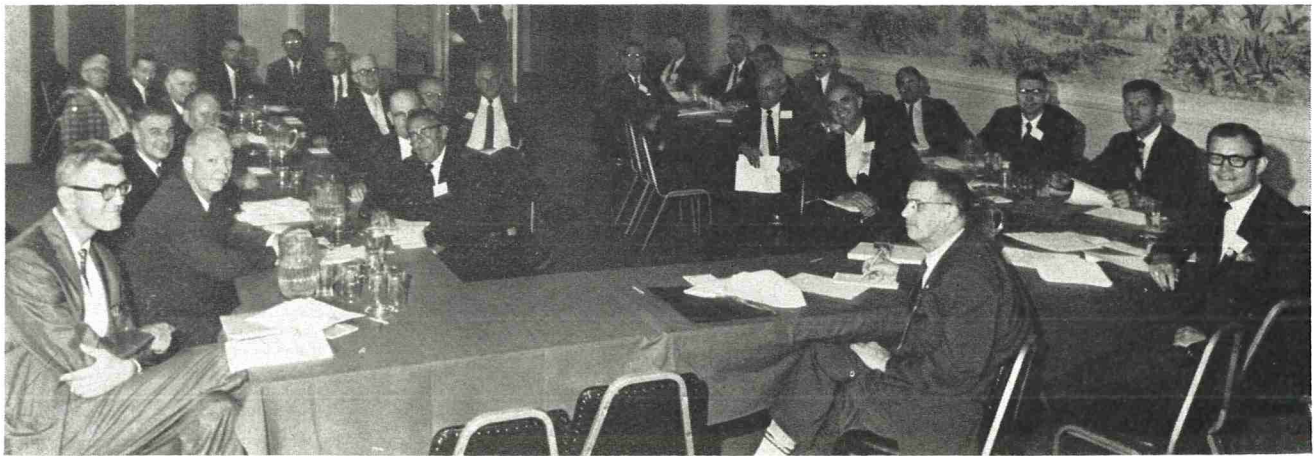
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| Wyandotte Chemical Co.      | George Land, Fla.           |
| Harts Dairy, Inc., Fla.     | Sunshine State Dairymens    |
| International Paper Co.     | Coop., Fla.                 |
| Haskon-Crystal Pkg. Div.    | Sealtest Foods, Fla.        |
| Paul Mueller Co.            | Charlotte, N. C.            |
| Walker Stainless Equip.     | Suncoast Milk Prod. Coop.,  |
| Co., Inc.                   | Fla.                        |
| Home Milk Producers         | Miller Len Festy Supply     |
| Assn., Fla.                 | Co., Fla.                   |
| Florida Dairy, Inc.         | Pages Dairy, Fla.           |
| Lonnie Jones Dairy, Fla.    | Tampa Ind. Dairy Farmers    |
| Wilbro Dairy, Fla.          | Foremost Dairies, Fla.      |
| G. A. Perret Farm           | T. G. Lee Dairy, Fla.       |
| Dinsmore, Fla.              | Sunnybrook Dairy, Fla.      |
| Field-Posey Dairy, Fla.     | McArthur Dairy, Fla.        |
| Perrys Ranch, Fla.          | Velda Farms, Fla.           |
| Bartow Food Co., Fla.       | Bordens Dairies, Fla.       |
| Dan Smith Dairy, Fla.       | Perfection Dairy, Fla.      |
| Expert Dairy Service, Inc., | Hoods Dairies, Fla.         |
| Fla.                        | Land-O-Sun Prod., Fla.      |
| Roy F. George Dairy, Fla.   | Dade City Dairies, Fla.     |
| Viking Pump Co.             | Ind. Dairy Farmers Assn.,   |
| Birchmore Dairy Supply,     | Fla.                        |
| Ga.                         | Gores Dairy, Fla.           |
| Ladish Co.                  | Dairy Farmers Mutual, Fla.  |
| Enrico Dairy, Fla.          | Heitfield Dairy, Inc., Fla. |
| Dairy Supply & Equip. Co.,  |                             |
| Fla.                        |                             |

*Signed, NORMAN N. TOBEY, General Chairman  
Local Arrangements  
Taylor Instrument Cos.*

**HONORARY LIFE MEMBERSHIP  
AWARDS**

- 1957—Dr. J. H. Shrader
- 1958—H. Clifford Goslee
- 1959—Dr. William H. Price (Charter Member 1911)
- 1961—Sarah Vance Dugan
- 1963—C. K. Johns and Dr. Harold Macy
- 1964—C. B. and A. L. Shogren
- 1966—Dr. M. R. Fisher
- 1967—C. A. Abele and L. A. Black

### GOOD ATTENDANCE AT 1967 AFFILIATE COUNCIL MEETING



1967 Affiliate Council meets with Executive Board.

The Affiliate Council representing state affiliate associations of IAMFES met at Miami Beach, Florida, on August 14, 1967 under the chairmanship of Erwin P. Gadd of Missouri. The tentative report of Secretary L. Wayne Brown, Wisconsin, is as follows:

"The IAMFES Affiliate Council, meeting on August 14, 1967, discussed the 3rd draft of the proposed By-Laws for a merged organization of sanitarians. The Council voted confidence in the IAMFES Executive Board for the general format of the proposed merger with the National Association of Sanitarians.

"While numerous questions were raised regarding specific provisions of the draft of By-Laws, formal action was taken on only two items. We urge the Executive Board to make every effort to effect the following changes:

(1) In Article VII, Section I, regarding the make-up of the Governing Council, change the word "Presidents" (of affiliate associations) to "Official Representatives." These might be the president, secretary or other qualified representative.

(2) In Article IX, Section I, regarding voting privileges, change to include Associate Members. While the discussion indicated that the Council members were generally opposed to the provision for two major classes of membership, formal action was taken only on the matter of voting privileges. "The incumbent officers, President and Secretary, were reelected for the coming year."

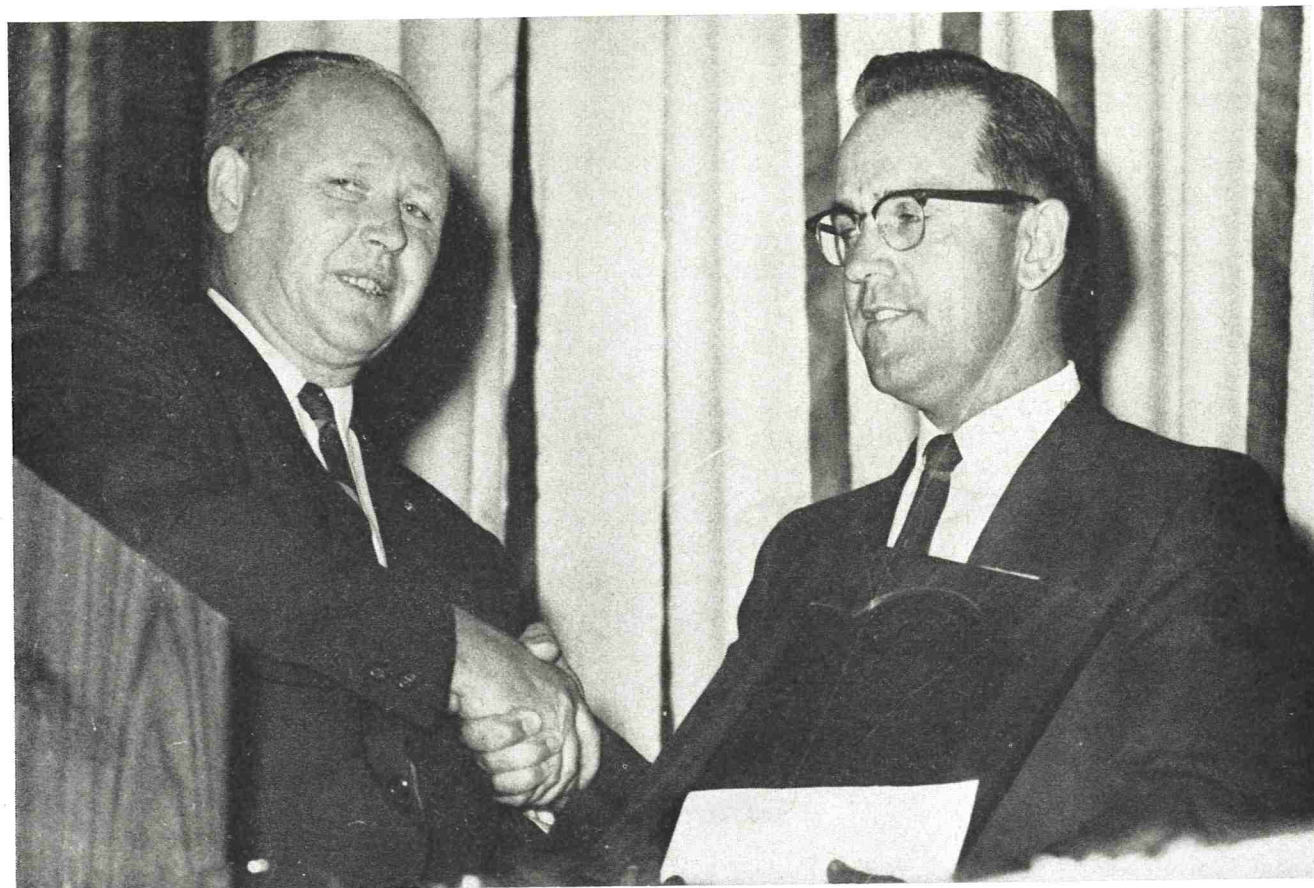
Members of the IAMFES Executive Board were invited to attend the portion of the Council meeting covering the discussion of the proposed By-Laws. President Elliker opened the discussion by a review of the work of the Ad Hoc Committee charged with the responsibility for preparing the proposed By-Laws.

The following affiliate representatives attended the 1967 meeting: Kenneth Hayes, California; Raymond Anderson, Connecticut; S. O. Noles, Florida; James A. Meany, Illinois; Theodore V. Crosley, Indiana; H. E. Hansen, Iowa; Leon Townsend, Kentucky; Robert Dalton, Michigan; O. M. Osten, Minnesota; Erwin P. Gadd, Missouri; Arthur Parker, Oregon; Sidney Barnard and Stephen Spencer, Pennsylvania; Sidney Shepard, Rhode Island; D. K. Bondler, New York; John Patillo, Virginia; Ben Luce, Washington; and L. Wayne Brown, Wisconsin.

#### CITATION AWARD WINNERS

- 1951—Dr. J. H. Shrader and William B. Palmer (posthumously)
- 1952—C. A. Abele
- 1953—Clarence Weber
- 1954—C. K. Johns
- 1955—Dr. R. G. Ross and A. W. Fuchs
- 1956—K. G. Weckel
- 1957—Fred C. Baselt
- 1958—Milton R. Fisher
- 1959—John D. Faulkner
- 1960—Dr. Luther A. Black
- 1961—Harold S. Adams
- 1962—Franklin W. Barber
- 1963—Dr. Merle P. Baker
- 1964—W. K. Moseley
- 1965—H. L. Thomasson
- 1966—Dr. J. C. Olson
- 1967—William V. Hickey



**1967 SANITARIAN AWARD  
TO ROGER L. STEPHENS**

Mr. Roger L. Stephens, Chief Sanitarian for the City Health Department at Logan, Utah was selected as Sanitarian of the Year at the 1967 convention of IAMFES. Mr. Stephens was honored for his outstanding work in an unusually wide area of environmental sanitation and also for his major participation in programs serving the welfare of his community.

A plaque was presented Mr. Stephens by Dr. W. C. Lawton, Chairman of the Recognition and Awards Committee of IAMFES at the annual banquet at Miami Beach, Florida, on August 16, 1967. It is the Committee's function to select from candidates recommended by state affiliate associations and others the sanitarian who has shown the greatest accomplishments as an employee of a municipal or county health organization or a state sanitarian acting in a similar capacity.

The Award is considered the highest national recognition to be bestowed upon a professional sanitarian. It carries with it a check for \$1000 contributed by three commercial companies active in the field of sanitation. The three companies are the Diversey Corporation, Klenszade Products Division of Economics Laboratory, Inc. and Pennsalt Chemicals, Inc.

In presenting the Award, Dr. Lawton reviewed some of Mr. Stephens accomplishments during the seven year period considered by the Committee in making its selection. In his work at Logan Mr. Stephens has been involved in a wide variety of programs including milk and dairy products control; restaurant, meat markets, groceries and baking inspections; swimming pool supervision; refuse disposal and rodent and insect control; and sanitation of nurseries and child day care centers.

He was one of the earliest advocates in his community for free stall housing for dairy cattle. After reviewing existing installations elsewhere he was able by means of a thorough understanding of problems and a careful preparation of material to convince a large number of producers to convert to this practice and to make other important improvements in herd health, milking procedures, environmental cleanliness and other factors in high quality milk production.

By working with managers of food handling establishments he developed a program of food handler education, leading to passage of an ordinance requiring all food handlers to have a permit based on the educational program and on good personal prac-

tices in food handling and serving. The quality of food establishments in the Logan area reflect the benefits of this food handler program and of the high level inspection control administered by Mr. Stephens.

Recognizing the need for elimination of an old refuse dump with its objectionable smoke fumes, odors, flies and rodents, he was able by an extensive public relations program to induce the city to set up and operate a sanitary land fill. Also by a persuasive educational program he convinced the city government of the value of a comprehensive mosquito control program.

For the betterment of his staff he has instituted an on-the-job training schedule consisting of short sessions daily for a discussion of current problems as well as a review of literature and other material which will improve the performance of his staff and achieve a better understanding of individual duties and responsibilities.

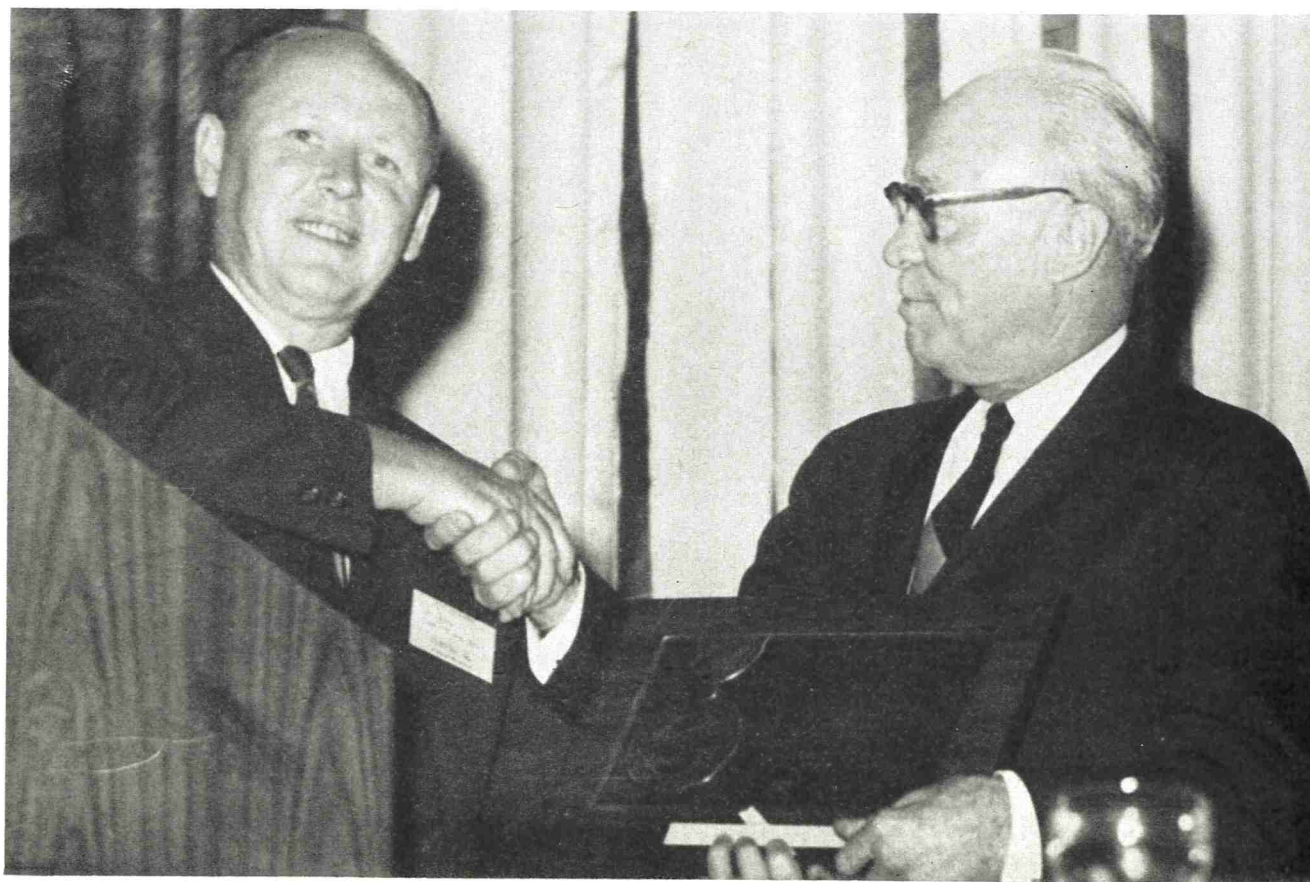
In spite of this long list of activities requiring a major portion of his time, Mr. Stephens has found

occasion to serve his community in other capacities. He has been President of the City Centennial Committee and Secretary of the City Landscape Improvement Committee. He supervises the city's sewage treatment facilities. He has also served as Co-Chairman of the local Dairy Day Committee, President of the Utah State Dairy Technology Society and on the Executive Board of the Interstate Milk Shippers Conference.

Moreover, he is an active participant in church, choir, scout and welfare programs of his church and community. And in his spare time has obtained the degree of Master of Science from his State University. Truly it may be said that Mr. Stephens has lived up to the wording on the citation accompanying the award which read as follows: "This Award is conferred for distinguished service to his community in the field of public health; for his contribution to the advancement of the Sanitarian; for his meritorious achievements in the field of milk, food and environmental sanitation; and for his ability to personalize the ideals of the Sanitarian."

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#### WILLIAM V. HICKEY GIVEN CITATION AWARD



Annually the IAMFES Citation Award is presented to a member of the Association who is deemed to have given unselfishly of his personal time and effort to further the aims of the Association and to contribute to the professional recognition of all sanitarians. Recipient of the 1967 Award presented at the Annual banquet at the recent meeting in Miami Beach was William V. Hickey, Secretary of the Public Health Committee of the Paper Cup and Container Institute, New York City, and Editor of the Health Officer's News Digest published by the Institute.

Bill's list of activities and accomplishments is long and varied. Early in his career he was engaged in local public health work as a member of the Salt Lake City Health Department. After serving for a number of years as Director of Environmental Sanitation he resigned to join the staff of the Paper Cup and Container Institute.

While in the Salt Lake area he was a member of the Rocky Mountain Association of Sanitarians and served a term as president of the organization. During his career he has been a member of the USPHS advisory committee on food establishment sanitation and participated in the preparation of a food service sanitation manual.

Bill has long been an active member of IAMFES and is a Past President. His committee assignments have been numerous and on various occasions he has served on such committees as Professional Development, Sanitarian's Joint Council and Intersociety Re-

lations. Bill as a resident of New York is a member of the New York State Association of Milk and Food Sanitarians and currently is chairman of its Committee on Food Sanitation.

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### BILL HICKEY EXPRESSES APPRECIATION FOR CITATION AWARD

In a letter to the Officers, Executive Board and Members of IAMFES, William V. Hickey, recipient of the 1967 Citation Award, extends his thanks and appreciation for the honor. Bill's letter is as follows:

"As I sit and survey the walls of my office, I am trying to determine where the Citation Award will be most prominent. In my humble opinion (regardless of how deserving I may be), it is one of the nicest things that ever happened to me.

"I realize that I was rather incoherent when I attempted to voice my gratitude on the occasion of the presentation.

"My more than thirty years in public health activities have brought many personal satisfactions and rewarding experiences. However, none have been more satisfying than the opportunities to work, plan, and associate with the officers of the International Association of Milk, Food and Environmental Sanitarians.

"I am still amazed, and grateful, that you selected me as recipient of the Citation Award. Thank you.

Sincerely yours,  
WILLIAM V. HICKEY

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### HONORARY LIFE MEMBERSHIPS TO C. A. ABELE AND LUTHER BLACK

As is customary at the business session of the Annual Convention of IAMFES, Honorary Life Membership is voted to a member who has given long service to the organization and who is considered as deserving special recognition for his valuable work in the sanitation and public health field. This year two such individuals were so honored.

Mr. C. A. Abele, Director of Public Health Research for the Diversey Corporation of Chicago, Illinois, was the first recipient. "Abe" is a Past President of the Association and long served as Chairman of the IAMFES Committee on Sanitary Procedures which participates in the well-known 3-A Sanitary Standards Program. He is currently Secretary-Treasurer of the 3-A Symbol Administrative Council which is responsible for authorization and use of the 3-A Symbol on dairy equipment meeting the standards.

The second recipient, Dr. Luther A. Black, retired August 1, 1967, as Chief, Milk Sanitation Research, Milk and Food Branch, U. S. Public Health Service at Cincinnati, a position he has held for a number of years. Luther similarly has been active in the affairs of IAMFES and has served on many of its standing and special committees. He is the author of numerous technical papers presented at annual meetings and published in the Journal and has long been recognized for his work in milk sanitation, particularly in the field of bacteriological research. Luther will be well remembered for his contributions in the preparation of various manuals used by sanitarians nationwide in inspection and laboratory control of milk production and processing and in the investigation of milk and foodborne disease outbreaks.



A. K. Saunders accepts Honorary Life Membership Award for C. A. Abele who was unable to attend meeting.

### C. A. ABELE RESPONDS TO LIFE MEMBERSHIP AWARD

As noted elsewhere in the Journal, C. A. "Abe" Abele was awarded an Honorary Life Membership in the Association at its recent Annual Meeting at Miami Beach. The award was made at the Annual Banquet and in "Abe's" absence due to an injury the plaque was accepted on his behalf by a fellow member from Chicago, A. K. "Kelly" Saunders.

In further recognition of the wide-spread personal regard by IAMFES members for "Abe" who hasn't missed an annual meeting since the mind of man runneth not to the contrary, a get-well card was circulated at the banquet and signed by those present. "Abe's" response to the award and to the card is given in the following typically phrased communication addressed "To the Members of IAMFES":

"It has always, heretofore, been my conviction that attendance at and participation in the Annual Meetings of the International Association of Milk, Food,

and Environmental Sanitarians provides professional advantages and personal benefits justifying necessary economies and sacrifices during the periods between meetings. However, certain features of the 1967 Annual Meeting of the Association, which occurred in my absence and affect me personally, have almost convinced me that rare absences have something going for them.

"It is rarely that a member is twice honored by the Association during a single Annual Meeting. That, however, has been my experience, and is the occasion for this acknowledgement.

"I have long been indebted to the Association as the recipient of the highest honors in its power to bestow and had no reason whatsoever to expect or to anticipate another. The bestowal of an Honorary Life Membership in the Association really maketh my cup to run over. It is humbly and appreciatively ac-



C. A. Abele

cepted; with the understanding, however, that it is not a symbol of fully-completed accomplishment and terminated usefulness. I shall display the plaque with pride and shall fulfill all the responsibilities of the title.

"The receipt of the autographed good wishes for an early recovery from the effect of the mishap responsible for my absence from the meeting, including personal messages from a number of members, was an agreeable surprise and, in itself, a second honor.

"Several of us old-timers autographed a Get-Well card to Dr. M. R. Fisher during the 1966 Annual Meeting; but it requires the initiative and ingenuity of an Ivan Parkin to improvise a means for obtaining the signatures of nearly two hundred banquetees!

"A few of the personal messages indicated a misconception of the nature of my mishap and implied it to have been caused by the decrepitude of advanced years. This is an implication I cannot permit to attain credence. I was returning from the garage roof, with a basket of cherries, when the feet of the ladder skidded on grit on the driveway. Neither dizziness, fatigue, weakness, nor poor co-ordination was responsible. Was slightly stupid in overlooking the grit. But one such attack produces relatively permanent immunity—at my age.

"I shall preserve and treasure the good wishes and autographs and trust that this statement may serve as an acknowledgement of all. I shall be walking by the time this is published.

C. A. ABELE

Past-President and  
Honorary Life Member

## AL MYHR OUR NEW PRESIDENT

For the first time in a number of years IAMFES has an international representative as its "Head Man." Dr. Allan N. Myhr of Guelph, Ontario, Canada, was handed the gavel of responsibility by outgoing President Paul Elliker at the 54th Annual Meeting at Miami Beach, Florida. Dr. Myhr is Professor of Dairy Science at the University of Guelph and his principle activities are research and dairy products extension.

"Al" as he is popularly known graduated from the University of Saskatchewan and received his M.S. and Ph.D. degrees from the University of Minnesota, the latter in 1958. Returning to Saskatchewan he served as Associate Professor of Dairy Bacteriology



until 1963 when he transferred to the University of Guelph.

For many years "Al" has been an active member of International and is also a member of a number of other professional societies, including the American Dairy Science Association, American Society for Microbiology and the Agricultural Institute of Canada. He is also Past President and Director of the Ontario Milk Sanitarians Association, an IAMFES affiliate.

Our new executive's active hobbies are golf, curling, fishing and music. He has had considerable renown as an accomplished pianist and his vocal talents brought him the one-time honor of President of the Saskatchewan Chapter of the Society for the Pre-

ervation and Encouragement of Barber Shop Quartet Singing in America.

"Al" has an unusually wide interest in all phases of milk, food and environmental sanitation and with his amiable disposition and his ability to handle all situations, International is fortunate in having its affairs in his hands for the coming year.

#### **DICK WHITEHEAD ELECTED SECOND VICE-PRESIDENT**



After counting mail ballots from qualified Association members it has developed that our new Second Vice-President is Dick B. Whitehead of Dallas, Texas. He is District Manager for Klenszade Products, a division of Economics Laboratory, Inc.

Dick received his B. S. in Agriculture in 1935 from the University of Missouri, majoring in dairy bacteriology with special work in food microbiology. After some five years in the dairy industry in production management, he returned to the University of Missouri for graduate work and a degree in bacteriology with studies in food, water and sewage problems.

From 1939 to 1956 with interruptions for four years (1942-1946) as an armored officer in the European theatre during World War II, Dick worked with the Sanitary Engineering Division of the Mississippi State Board of Health. For most of the period he served as Supervisor of Milk and Food Control.

Included in his activities at the state level was the development of a sanitary standard for the School Lunch Program. He also conducted yearly food service work-shops at several state universities and colleges.

On a national scale he was instrumental in the establishment of the National Conference on Interstate Milk Shipments. He has served on the Dry Milk Standards Committee and has been active on

the Advisory Committee which develops the standard Milk Ordinance and Regulations. For a number of years he has been a member of the IAMFES Committee on Sanitary Procedures and has served as its Chairman for the past several years.

In 1956 he left the Mississippi State Board of Health to set up Klenszade Southern, Inc. specializing in sales of detergent supplies and technical services to the dairy industry. In 1964 this franchise was sold to the parent organization and he assumed his present district manager position.

Throughout his professional career Dick has striven to encourage a good and productive working relationship between regulatory agencies and industry. He has worked diligently to improve the professional status of the sanitarian and brings to International as a new officer and member of the Executive Board a background of experience which should be of extreme value to the organization.

#### **KARL JONES CONTINUES AS SECRETARY-TREASURER**



By mail ballot of the members Karl K. Jones, Environmental Health and Sanitation Officer, Student Health Services at Purdue University, West Lafayette, Indiana was re-elected Secretary-Treasurer of IAMFES. The organization is fortunate to have a person of his character and devotion to responsibility in this important position.

Karl received his B.S. in Public Health from the University of Indiana in 1950 and served for several years as a regional sanitarian in southwestern Indiana. From 1952 to 1957 he was State Retail Survey Officer and was then appointed Chief of the Retail Food Section of the State Board of Health. Several months ago he transferred his allegiance to Purdue's

Student Health Services program.

Karl has long been interested in sanitarian activities. He is a charter member of the Indiana Sanitarians Association, an IAMFES affiliate, as well as a member of the American Public Health Association. He serves on the Indiana State Board of Registration for Sanitarians.

In addition to his duties as Secretary-Treasurer, Karl has been Chairman of the IAMFES Committee on Food Equipment Sanitary Standards and has guided its cooperative work with the National Sanitation Foundation, the National Automatic Merchandizing Association and similar organizations in the establishment of standards for design, fabrication, installation and operation of food equipment.

#### SANITARIANS AWARD WINNERS AND THEIR POSITIONS AT THE TIME OF THE AWARD

1952—Paul Corash, Chief of Milk Division, Bureau of Food and Drugs, New York, New York

1953—Dr. E. F. Meyers, Chief of Milk, Meat, and Food Division, City Health Department, Grand Rapids, Michigan

1954—Kelley G. Vester, Senior Sanitarian, City Health Department, Rocky Mount, North Carolina

1955—B. G. Tennent, Chief Sanitarian, Escambia County Health Department, Pensacola, Florida

1956—John H. Fritz, Chief of Milk and Food Section, City Health Department, Kansas City, Missouri

1957—Harold J. Barnum, Chief of Milk Sanitation, City Health Department, Green Bay, Wisconsin

1959—William Kempa, Dairy and Milk Inspector, City of Regina, Saskatchewan, Canada

1960—James C. Barringer, Director of Sanitation, City Health Department, Evansville, Indiana

1961—Martin C. Donovan, Airport Sanitarian, Dade County Health Department, Miami, Florida

1962—Larry Gordon, Director, City-County Health Department, Albuquerque, New Mexico

1963—R. L. Cooper, Administrative Assistant, Callaway County Health Department, Murray, Kentucky

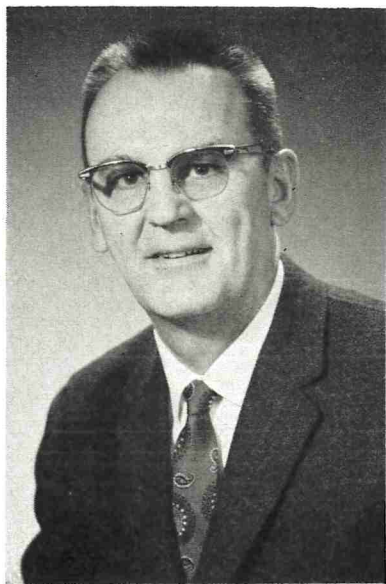
1964—No recipient

1965—Harold R. Irvin, Chief, Milk Sanitation Section, Omaha Douglas County Health Department, Omaha, Nebraska

1966—Paris B. Boles, Senior County Sanitarian, Wayne County Health Department, Monticello, Kentucky

1967—Roger L. Stephens, Chief Sanitarian, City Health Department, Logan, Utah

### J. C. OLSON, JR. RESIGNS AS JOURNAL EDITOR E. H. MARTH ACCEPTS POST



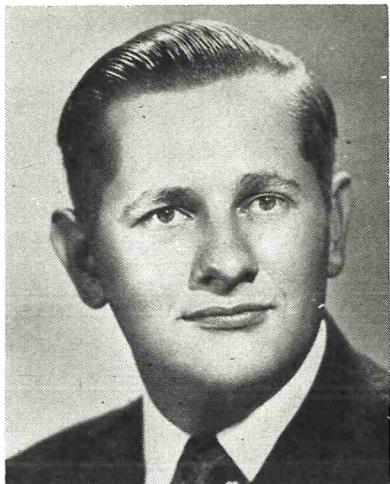
Dr. J. C. Olson

Dr. J. C. Olson, Jr., Editor of the Journal of Milk and Food Technology since 1954, has submitted his resignation effective October 1, 1967. Formerly on the staff of the University of Minnesota where he

was Professor of Bacteriology, Department of Food Science and Industries, Dr. Olson became Director of the Division of Microbiology, U. S. Food and Drug Administration, DHEW, August 21. His move to Washington, D. C. and the scope and extent of his new responsibilities made it advisable that he relinquish his post on the Journal staff.

Joe Olson's period of service on the University staff dates back to 1937 shortly after he received his B.S. degree. He earned his Ph.D. degree in 1948 and his teaching and research work has covered general microbiology, dairy and food microbiology and milk regulatory control. His activities have extended to national and international levels and he has served with a number of major committees and organizations dealing with dairy and food science developments.

A long time member of International Joe has worked on various Association committee assignments in addition to his editorship. He has authored more than 60 scientific and technical papers, many of which were published in the Journal. Under his guidance the Journal has reached its present high standing and wide acceptance as a leading scientific publication. Last year at the IAMFES annual meeting he



Dr. Elmer H. Marth

was given the Citation Award for outstanding service to the organization and for meritorious efforts in promoting the professional recognition of sanitarians.

In his new assignment with FDA Dr. Olson will be concerned with research and development of microbiological methods used in enforcing the Federal Food, Drug and Cosmetics Act. Areas of major importance will include food-borne diseases; new methods of food preservation, such as radiation, gas sterilization and freeze drying; and antiseptics and their effectiveness.

The best wishes of all of the members of International go with Joe in his new field of endeavors.

Assuming the position of Journal Editor on October 1, will be Dr. Elmer H. Marth, Associate Professor

of Food Science and Industries at the University of Wisconsin, Madison. Elmer Marth is eminently qualified for the assignment, having an extensive scientific background and a great deal of experience in writing and publication of technical material. He is the author and co-author of some seven text and reference books and more than 50 papers in a wide field covering antibiotics in food, chlorinated hydrocarbon insecticides in foods and feeds, metabolism of microorganisms and microbiology of dairy and food products and sanitation.

Dr. Marth earned his under-graduate and Ph.D degrees at the University of Wisconsin, the latter in 1954. After some three years as an Instructor in Bacteriology at the University he joined the staff of the Research and Development Division of National Dairy Products Corporation at Glenview, Illinois, where he rose to the position of Associate Manager of the Microbiological Laboratory. His principal research interests while at NDP covered food fermentation, microbiological processes associated with flavor production and cheese ripening, production of cottage cheese and other cultured dairy products, antibiotics and pesticide residues in foods and methods of storage of microbial cultures.

Dr. Marth returned to the University of Wisconsin in May, 1966 in his present position. His work brings him into Bacteriology and the Food Research Institute at the University. In addition to IAMFES he is a member of the American Society for Microbiology and the American Dairy Science Association.

Elmer is welcomed to the staff of the Journal of Milk and Food Technology.

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#### ERRATUM

Attention is directed to the paper by Smith and David, *J. Milk Food Technol.* 30:186-188. 1967. Captions for figures 1 and 2 are transposed.



## HOLDERS OF 3-A SYMBOL COUNCIL AUTHORIZATIONS ON AUGUST 20, 1967

### 0101 Storage Tanks for Milk and Milk Products, as Amended

97	Beseler Steel Products, Inc.	( 3/24/58)
	417 East 29th, Marshfield, Wisconsin 54449	
116	Jacob Brenner Company, Inc.	(10/ 8/59)
	450 Arlington, Fond du Lac, Wisconsin 54935	
28	Cherry-Burrell Corporation	(10/ 3/56)
	2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404	
102	Chester-Jensen Company, Inc.	( 6/ 6/58)
	5th & Tilgham Streets, Chester, Pennsylvania 19013	
1	Chicago Stainless Equipment Corp.	( 5/ 1/56)
	5001 No. Elston Avenue, Chicago, Illinois 60630	
2	CP Division, St. Regis	( 5/ 1/56)
	1243 W. Washington Blvd., Chicago, Illinois 60607	
117	Dairy Craft, Inc.	(10/28/59)
	Holdingford, Minnesota 56340	
76	Damrow Brothers Company	(10/31/57)
	196 Western Avenue, Fond du Lac, Wisconsin 54935	
115	DeLaval Company, Ltd.	( 9/28/59)
	113 Park Street, So., Peterborough, Ont., Canada	
109	Girton Manufacturing Company	( 9/30/58)
	Millville, Pennsylvania 17846	
21	The J. A. Gosselin Co., Ltd.	( 9/20/56)
	P. O. Box 280, Drummondville, Quebec, Canada	
44	The Heil Company	(10/26/56)
	3000 W. Montana Street, Milwaukee, Wisconsin 53235	
114	C. E. Howard Corporation	( 9/21/59)
	9001 Rayo Avenue, South Gate, California 90280	
127	Paul Mueller Company	( 6/29/60)
	1616 W. Phelps Street, Springfield, Missouri 65801	
143	Portersville Stainless Equipment Div.,	( 5/16/63)
	Gibson Industries, Inc.	
	Portersville (Butler County), Pennsylvania 16051	
39	Stainless & Steel Products Co.	(10/20/56)
	1000 Berry Avenue, St. Paul, Minnesota 55114	
31	Walker Stainless Equipment Co.	(10/ 4/56)
	Elroy, Wisconsin 53929	

### 0204 Pumps for Milk and Milk Products, Revised, as Amended

29R	Cherry-Burrell Corporation	(10/ 3/56)
	2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404	
147R	R. S. Corcoran Co.	( 1/ 8/64)
	500 Old Hickory Road, New Lenox, Ill. 60451	
63R	CP Division, St. Regis	( 4/29/57)
	1243 W. Washington Blvd., Chicago, Illinois 60607	
180R	The DeLaval Separator Co.	( 5/ 5/66)
	Poughkeepsie, N. Y. 12602	
65R	G & H Products Corporation	( 5/22/57)
	5718 52nd Street, Kenosha, Wisconsin 53140	
145R	ITT Jabsco, Incorporated	(11/20/63)
	1485 Dale Way, Costa Mesa, Calif. 92626	
26R	Ladish Co., Tri-Clover Division	( 9/29/56)
	2809 60th Street, Kenosha, Wisconsin 53140	
148R	Robbins & Myers, Inc.	( 4/22/64)
	Moyno Pump Division	
	1895 Jefferson Street, Springfield, Missouri 65803	
163R	Sta-Rite Products, Inc.	( 5/ 5/65)
	234 South 8th Street, Delavan, Wisconsin 53115	

72R	L. C. Thomsen & Sons, Inc.	( 8/15/57)
	1303 53rd Street, Kenosha, Wisconsin 53140	
175R	Universal Milking Machine Div.,	(10/26/65)
	National Cooperatives, Inc.	
	First Avenue at College, Albert Lea, Minn. 56007	
52R	Viking Pump Company	(12/31/56)
	406 State Street, Cedar Falls, Iowa 50613	
5R	Waukesha, Foundry Company	( 7/ 6/56)
	Waukesha, Wisconsin 53186	

### 0402 Homogenizers and High Pressure Pumps of the Plunger Type, As Amended

87	Cherry-Burrell Corporation	(12/20/57)
	2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404	
37	CP Division, St. Regis	(10/19/56)
	1243 W. Washington Blvd., Chicago, Illinois 60607	
75	Manton-Gaulin Mfg. Co., Inc.	( 9/26/57)
	44 Garden Street, Everett, Massachusetts 02149	

### 0506 Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service, As Amended

131	Almont Welding Works, Inc.	( 9/ 3/60)
	4091 Van Dyke Road, Almont, Michigan 48003	
98	Beseler Steel Products, Inc.	( 3/24/58)
	417 East 29th, Marshfield, Wisconsin 54449	
70	Jacob Brenner Company	( 8/ 5/57)
	450 Arlington, Fond du Lac, Wisconsin 54935	
118	Dairy Craft, Inc.	(10/28/59)
	Holdingford, Minnesota 56340	
66	Dairy Equipment Company	( 5/29/57)
	1919 So. Stoughton Road, Madison, Wisconsin 53716	
123	DeLaval Company, Ltd.	(12/31/59)
	113 Park Street, South, Peterborough, Ont., Canada	
190	Eastern Industries, Limited	(11/18/66)
	830 Blvd., Lemire, Drummondville, Quebec, Canada	
121	The J. A. Gosselin Co., Ltd.	(12/ 9/59)
	P. O. Box 280, Drummondville, Quebec, Canada	
45	The Heil Company	(10/26/56)
	3000 W. Montana Street, Milwaukee, Wisconsin 53235	
93	Pennsylvania Furnace & Iron Co.	( 2/ 6/58)
	316 Pine Street, Warren, Pennsylvania 16365	
85	Polar Manufacturing Company	(12/20/57)
	Holdingford, Minnesota 56340	
144	Portersville Stainless Equipment Div.,	( 5/16/63)
	Gibson Industries, Inc.	
	Portersville (Butler County), Pennsylvania 16051	
71	Progress Industries, Inc.	( 8/ 8/57)
	400 E. Progress Street, Arthur, Illinois 61911	
80	Mueller/Richardson, Ltd.	(11/24/57)
	84 Wellington Street, So., St. Marys, Ont., Canada	
40	Stainless & Steel Products Company	(10/20/56)
	1000 Berry Avenue, St. Paul, Minnesota 55114	
47	Standard Steel Works, Inc.	(11/ 2/56)
	16th & Howell Streets, North Kansas City, Mo. 64116	
189	A. & L. Tougas, Ltée,	(10/ 3/66)
	1 Tougas St., Iberville, Quebec, Canada	
25	Walker Stainless Equipment Co.	( 9/28/56)
	New Lisbon, Wisconsin 53950	

**0800-07 Fittings Used on Milk and Milk Products Equipment, and Used on Sanitary Lines Conducting Milk and Milk Products and Supplements 2, 3, 4, 5, and 6, As Amended**

79	Alloy Products Corporation	(11/23/57)
	1045 Perkins Avenue, Waukesha, Wisconsin 53186	
138	A.P.V. (Canada) Equipment, Ltd.	(12/17/62)
	103 Rivalda Rd., Weston, Ont., Canada	
82	Cherry-Burrell Corporation	(12/11/57)
	2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404	
124	DeLaval Company, Ltd.	(2/18/60)
	113 Park Street, South, Peterborough, Ont., Canada	
184	The DeLaval Separator Co.	(8/9/66)
	Poughkeepsie, New York 12602	
67	G & H Products Corporation	(6/10/57)
	5718 52nd Street, Kenosha, Wisconsin 53140	
105	Girton Manufacturing Company	(7/25/58)
	Millville, Pennsylvania 17846	
89	Burton Klemp Corporation	(3/24/60)
	6613 28th Avenue, Kenosha, Wisconsin 53140	
34	Ladish Co., Tri-Clover Division	(10/15/56)
	2809 60th St., Kenosha, Wisconsin 53140	
149	Q Controls	(5/18/64)
	Occidental, California 95465	
73	L. C. Thomsen & Sons, Inc.	(8/31/57)
	1303 43rd Street, Kenosha, Wisconsin 53140	
191	Tri-Canada Fittings & Equipment, Ltd.	(11/23/66)
	21 Newbridge Road, Toronto 18, Ontario	
151	Tubular Components, Inc.	(11/18/64)
	Butternut Drive, East Syracuse, New York 13057	
89	Waukesha Specialty Company	(12/20/57)
	Walworth, Wisconsin 53184	

**0902 Thermometer Fittings and Connections Used on Milk and Milk Products Equipment and Supplement 1, As Amended**

32	Taylor Instrument Companies	(10/4/56)
	95 Ames Street, Rochester, New York 14611	

**1001 Milk and Milk Products Filters Using Disposable Filter Media, As Amended**

35	Ladish Co., Tri-Clover Division	(10/15/56)
	2809 60th Street, Kenosha, Wisconsin 53140	

**1102 Plate-Type Heat Exchangers for Milk and Milk Products, As Amended**

20	A.P.V. Company, Inc.	(9/4/56)
	137 Arthur Street, Buffalo, New York 14207	
30	Cherry-Burrell Corporation	(10/1/56)
	2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404	
14	Chester-Jensen Co., Inc.	(8/15/56)
	5th & Tilgham Streets, Chester, Pennsylvania 19013	
38	CP Division, St. Regis	(10/19/56)
	1243 W. Washington Blvd., Chicago, Illinois 60607	
120	DeLaval Company, Ltd.	(12/3/59)
	113 Park Street, South, Peterborough, Ont., Can.	
17	The DeLaval Separator Company	(8/30/56)
	Poughkeepsie, New York 12602	
15	Kusel Dairy Equipment Company	(8/15/56)
	100 W. Milwaukee Street, Watertown, Wisconsin 53094	

**1202 Internal Return Tubular Heat Exchangers, for Milk and Milk Products, As Amended**

103	Chester-Jensen Company, Inc.	(6/6/58)
	5th & Tilgham Street, Chester, Pennsylvania 19013	
96	C. E. Rogers Company	(3/31/64)
	8731 Witt Street, Detroit, Michigan 48209	
152	Sanitary Processing Equipment Corp.	(11/18/64)
	Butternut Drive, East Syracuse, New York 13057	

**1303 Farm Milk Cooling and Holding Tanks— Revised, As Amended**

99R	Henry C. Bergmann, Inc.	(3/28/58)
	4350 W. Artesia St., Fullerton, California 92631	
19R	Dairy King Sales and Service Corp.	(9/1/56)
	Kearns Bldg., Salt Lake City, Utah 84101	
11R	CP Division, St. Regis	(7/25/56)
	1243 W. Washington Street, Chicago, Illinois 60607	
119R	Dairy Craft, Inc.	(10/28/59)
	Holdingford, Minnesota 56340	
4R	Dairy Equipment Company	(6/15/56)
	1919 S. Stoughton Road, Madison, Wisconsin 53716	
92R	Delaval Company, Ltd.	(12/27/57)
	113 Park Street, South Peterborough, Ontario, Canada	
49R	The Delaval Separator Company	(12/5/56)
	Poughkeepsie, New York 12602	
94R	Esco Cabinet Company	(2/6/58)
	West Chester, Pennsylvania 19380	
10R	Girton Manufacturing Company	(7/25/56)
	Millville, Pennsylvania 17846	
95R	Globe Fabricators, Inc.	(3/14/58)
	7744 Madison Street, Paramont, California 90723	
179R	Heavy Duty Products (Preston), Ltd.	(3/8/66)
	635 Laurel St., Preston, Ont., Canada	
51R	C. E. Howard Corporation	(12/20/56)
	9001 Rayo Avenue, South Gate, California 90280	
61R	James Mfg. Co., Sani-Kool Division	(4/2/57)
	104 W. Milwaukee Avenue, Fort Atkinson, Wis. 53538	
41R	Mojonnier Bros. Company	(10/22/56)
	4601 W. Ohio Street, Chicago, Illinois 60644	
12R	Paul Mueller Company	(7/31/56)
	1616 W. Phelps Street, Springfield, Missouri 65801	
58R	Schweitzer's Metal Fabricators, Inc.	(2/25/57)
	806 No. Todd Avenue, Azusa, California 91702	
50R	Emil Steinhorst & Sons, Inc.	(12/20/56)
	612-616 South Street, Utica, New York 13503	
134R	Universal Milking Machine Division	(5/19/61)
	National Co-operatives, Inc. First Avenue at College, Albert Lea, Minn. 56007	
182R	Vacooler Co.	(5/20/66)
	700 Gaylord Ave., Elyria, Ohio 44035	
42R	VanVetter, Inc.	(10/22/56)
	2130 Harbor Avenue S.W., Seattle, Washington 98126	
18R	Whirlpool Corporation, St. Paul Division	(9/20/56)
	850 Arcade Street, St. Paul, Minnesota 55106	
55R	John Wood Company,	(1/23/57)
	Superior Metalware Division 509 Front Avenue, St. Paul, Minnesota 55117	
170R	The W. C. Wood Co., Ltd.	(8/9/65)
	5 Arthur Street, South, Guelph, Ont., Canada	
16R	Zero Manufacturing Company	(8/27/56)
	Washington, Missouri 63090	

**1400 Inlet and Outlet Leak Protector Plug Valves  
for Batch Pasteurizers**

- 122 Cherry-Burrell Corporation (12/11/59)  
2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404
- 69 G & H Products Corporation (6/10/57)  
5718 52nd Street, Kenosha, Wisconsin 53140
- 27 Ladish Co. - Tri-Clover Division (9/29/56)  
2809 60th Street, Kenosha, Wisconsin 53140
- 78 L. C. Thomson & Sons, Inc. (11/20/57)  
1303 43rd Street, Kenosha, Wisconsin 53140

**1500 Manually-Operated Bulk Milk and Milk Products  
Dispensers, Multi-Service Milk Containers,  
and Dispensing Mechanisms**

- 74 American Industries, Inc. (9/11/57)  
Box 5580, Minneapolis, Minnesota 55408
- 23 Monitor Dispenser Co., Inc. (9/27/56)  
West Main Street, Stroudsburg, Pennsylvania 18360
- 62 Norris Dispensers, Inc. (4/8/57)  
2720 Lyndale Avenue, South, Minneapolis, Minn. 55408
- 194 Schaefer Div. - Studebaker Corp. (3/13/67)  
801 Washington St., No., Minneapolis, Minn. 55413
- 108 Stevens-Lee Company (8/12/58)  
822 W. 59-1/2 Street, Minneapolis, Minn. 55419

**1602 Evaporators and Vacuum Pans for Milk and  
Milk Products, As Amended**

- 132 A.P.V. Company, Inc. (10/26/60)  
137 Arthur Street, Buffalo, New York 14207
- 111 Blaw-Knox Company, (2/12/59)  
Dairy Equipment Division  
750 E. Perry, Buffalo, N. Y. 14210
- 110 Arthur Harris & Company (11/10/58)  
210-218 North Aberdeen Street, Chicago Illinois 60607
- 128 Mojonnier Bros. Co. (7/6/60)  
4601 W. Ohio Street, Chicago, Illinois 60644
- 164 Mora Industries, Inc. (4/25/65)  
112 South Park Street, Mora, Minnesota 55051
- 107 C. E. Rogers Company (8/1/58)  
8731 Witt Street, Detroit, Michigan 48209
- 186 Marriott Walker Corporation (9/6/66)  
925 East Maple Road, Birmingham, Mich. 48008

**1702 Fillers and Sealers of Single Service Containers,  
For Milk and Milk Products, As Amended**

- 192 Cherry-Burrell Corporation (1/3/67)  
2400 Sixth St., S.W., Cedar Rapids, Iowa 52404
- 139 Exact Weight Scale Company (4/15/68)  
538 East Town Street, Columbus, Ohio 43215
- 137 Ex-Cell-O Corporation (10/17/62)  
P. O. Box 386, Detroit, Michigan 48232
- 140 General Films, Inc. (4/23/63)  
Covington, Ohio 55318
- 153 Mantes Scale Co. (1/6/65)  
489 Sixth Street, San Francisco, California 94103
- 142 Polygal Company (4/15/63)  
Div. of Inland Container Corp.  
P. O. Box 68074, Indianapolis, Indiana 46268

**1901 Batch and Continuous Freezers, For Ice Cream,  
Ices and Similarly Frozen Dairy Foods, As Amended**

- 141 CP Division, St. Regis (4/15/63)  
1243 W. Washington Blvd., Chicago, Illinois 60607
- 146 Cherry-Burrell Corporation (12/10/63)  
2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404

**2200 Silo-Type Storage Tanks for Milk and  
Milk Products**

- 168 Cherry-Burrell Corporation (6/16/65)  
2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404
- 154 CP Division, St. Regis (2/10/65)  
1243 W. Washington Blvd., Chicago, Illinois 60607
- 160 Dairy Craft, Inc. (4/5/65)  
Holdingford, Minnesota 56340
- 181 Damrow Brothers Company (5/18/66)  
196 Western Ave., Fond du Lac, Wisconsin 54935
- 156 C. E. Howard Corporation (3/9/65)  
9001 Rayo Avenue, South Gate, California 90280
- 155 Paul Mueller Co. (2/10/65)  
1616 W. Phelps Street, Springfield, Missouri 65801
- 195 Mueller/Richardson, Ltd. (7/6/67)  
84 Wellington St., So., St. Mary's, Ont., Canada
- 165 Walker Stainless Equipment Co. (4/26/65)  
New Lisbon, Wisconsin 53950

**2300 Equipment for Packaging Frozen Desserts,  
Cottage Cheese and Milk Products Similar to Cottage  
Cheese in Single Service Containers**

- 174 Anderson Bros. Mfg. Co. (9/28/65)  
1303 Samuelson Road, Rockford, Illinois 61109
- 178 John A. Carrier Corporation (2/18/66)  
Middlesex Turnpike, Burlington, Iowa 52601
- 193 Triangle Package Machinery Co. (1/31/67)  
6655 West Diversey Ave., Chicago, Illinois 60635

**2400 Non-Coil Type Batch Pasteurizers**

- 161 Cherry-Burrell Corporation (4/5/65)  
2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404
- 158 CP Division, St. Regis (3/24/65)  
1243 W. Washington Blvd., Chicago, Illinois 60607
- 187 Dairy Craft, Inc. (9/26/66)  
Holdingford, Minneapolis 56340
- 177 Girton Manufacturing Co. (2/18/66)  
Millville, Pennsylvania 17846
- 166 Paul Mueller Co. (4/26/65)  
1616 W. Phelps Street, Springfield, Missouri 65802

**2500 Non-Coil Type Batch Processors for Milk and  
Milk Products**

- 162 Cherry-Burrell Corporation (4/5/65)  
2400 Sixth Street, S.W., Cedar Rapids, Iowa 52404
- 159 CP Division, St. Regis (3/24/65)  
1243 W. Washington Blvd., Chicago, Illinois 60607

188	Dairy Craft, Inc. Holdingford, Minneapolis 56340	( 9/26/66)	173	Food & Chemical Equipment Div., Blaw-Knox Company 1325 S. Cicero Avenue, Chicago, Illinois 60650	( 9/20/65)
167	Paul Mueller Co. 1616 W. Phelps Street, Springfield, Missouri 64801	( 4/26/65)	185	The Orville-Simpson Co. 1230 Knowlton St., Cincinnati, Ohio 45223	( 8/10/66)
196	Mueller/Richardson, Ltd. 84 Wellington St., So., St. Mary's, Ont., Canada	( 7/ 6/67)	172	Southwestern Engineering Co. 6111 E. Bandini Blvd., Los Angeles, California 90022	( 9/ 1/65)
<b>2600 Sifters for Dry Milk and Dry Milk Products</b>					
171	Entoleter, Inc. Subsidiary of American Mfg. Co. 1187 Dixwell Avenue, Hamden, Connecticut 06514	( 9/ 1/65)	176	Sprout, Waldron & Co., Inc. Munsey, Pennsylvania 17756	( 1/ 4/66)

## NEWS AND EVENTS

### DAIRY TRADE ASSOCIATION EXECUTIVE PRESENTED "KEY AWARD" FOR 1967



Robert H. North, Executive Vice President of the International Association of Ice Cream Manufacturers and the Milk Industry Foundation, has been selected to receive the 1967 "Key Award" presented by the American Society of Association Executives.

The Award is given to an association executive in recognition of his "outstanding service to the field of association management, his own industry, his community and nation." The Society is a national organization of more than 2300 persons in association management.

Mr. North has been with the IAICM since 1945, and in 1964 assumed the added function of chief executive officer with the MIF.

The ASAE Selection Committee cited his accomplishments in "promoting the free enterprise system in America through strong, voluntary effort by the industry he serves, and his many contributions to the voluntary association movement."

The recipient also serves as secretary-treasurer of the Dairy Products Improvement Institute and of the Dairy Industry Committee. He is vice chairman of the Special Dairy Industry Board, created to carry out research and special education programs for the dairy industry.

Mr. North has been a prime mover in organizing trade associations to work together on common problems. In 1956 he was the first chairman of the Trade Associations Coordinating Committee on Government Competition. In 1962 he helped organize the Industry Committee on Packaging and Labeling, which now consists of representatives of 75 trade groups and 125 business companies.

In addition to his many dairy industry activities, Mr. North is a member of the advisory board of the Madison Bank, Washington, D. C., and a board member of the National Highway Users Conference and the Private Truck Council of America. He serves as a board member of the American Association Old Line Life Insurance Co. He also is a past president of the American Society of Association Executives.

Mr. North and his wife reside in Bethesda, Maryland.

### GOVERNMENT OFFICIALS ADVISE CAUTION IN CHANGES IN PACKAGING AND LABELING

Government officials recently have advised representatives of packaging suppliers to the dairy and food industries to go slowly before making any radical, costly changes in labels or packaging. The supplier group, anxious to inform customers about the current status of the Fair Packaging and Labeling Act regulations, assembled in Washington August 16 to exchange views with federal officials on how best to implement the legislation. The meeting was arranged by the Dairy and Food Industries Supply

Association at the request of its interested members.

Representatives from four government agencies addressed the seminar, each one outlining his department's authority, jurisdiction and regulations. Speakers were: Associate Commissioner for Compliance J. Kenneth Kirk, Food and Drug Administration; Harold Kennedy, Chief, Special Projects, Federal Trade Commission; Dr. Raymond Wenger, Consumer and Marketing Service, U. S. Department of Agriculture; and Eric A. Vadelund, Office of Weights and Measures, Bureau of Standards, U. S. Department of Commerce.

They talked of their concern for the problems involved in the changes and what this could mean in machine and labeling costs which the packagers and suppliers now face. Further, they invited comments from the packaging companies present concerning the regulations as published by the FTC, FDA and Bureau of Standards. Such comments can be submitted formally or informally as a group or individually, the speakers said.

Although meat and poultry packaging and labeling are exempt under the Fair Packaging and Labeling Act, USDA intends to change its regulations so that all government package labeling regulations will be uniform. The group learned, however, that Agriculture doesn't expect to accomplish this for several months.

A number of requests for exemptions already are pending, the officials said. They also indicated that an overlapping of area jurisdiction among several government agencies prevents finalization of effective regulations at this time.

The speakers reminded the suppliers that the new law applies only to products in interstate commerce. They further indicated that packaging suppliers who are directly affected by the requirements of the law and regulations have the right to request hearings, exemptions or modifications.

Both government and industry representatives expressed interest in close cooperation and communication to insure orderly implementation of the law. Suppliers said they intend to keep closely posted on the finalization of regulations and procedures.

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### ANNUAL CONVENTION OF VENDING INDUSTRY ASSOCIATION

Modern-day management methods, the use of data processing for vending, and the potential of convenience foods will highlight four days of business sessions at the 1967 National Automatic Merchandising Association Convention and Exhibit of Automatic Merchandising which is scheduled for October 28 to 31 in Chicago.

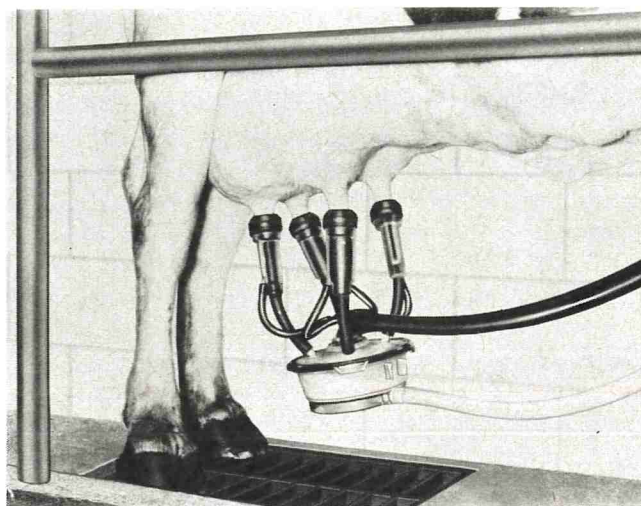
Some 10,000 vending industry executives and personnel are expected at the convention which is managed by N A M A. The workshops and discussion meetings will take place at the Conrad Hilton Hotel and the exhibit will be at Donovan Hall of the International Amphitheatre.

Featured on the convention program will be "steps to improve customer relations," "analyzing management attitudes and performance for profit planning," "how vending operators can profit from using data processing," "developments in frozen foods for vending," "routemen incentive compensation," "a sanitation workshop for vending routemen and supervisors," and "route management, analysis and control," Farren announced.

The exhibit will be the largest vending show ever held, occupying 65,000 square feet of space from the previous high of 60,000 in 1966. Among the 158 companies exhibiting at the show will be manufacturers of vending machines, of parts and components, and of vendible products.

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### NEW ZERO CONCORD MILKING SYSTEM



A revolutionary-designed milker unit makes possible the new Zero Concord Milking System's scientific milking principle . . . Twin-Vacuum . . . whereby one vacuum milks the cows—and another, entirely-different vacuum moves the milk through the milk-conveying vacuum line into the Zero Completely-Automated Vacuum Bulk Milk Cooler.

The Zero Concord's Twin-Vacuum operation eliminates the need for injecting air into the milker units—which helps prevent mechanically-induced butterfat break-up, a major cause of rancidity in milk; and keeps air-laden bacteria and odors out of the milk.

It also eliminates vacuum fluctuation—providing the absolute, uniform and low vacuum at each individual cow that's necessary for safe, fast milking. Does away with the need

for an expensive, hard-to-clean releaser or milk pump. And, in addition, makes possible "push-button" self-cleaning and sanitizing of the milking vacuum line, milk conveying vacuum line and the vacuum bulk tank.

The Zero Concord's milker units and shells are made of a new, light, strong transparent material that gives clear vision of their interiors while milking and cleaning. And allows total vision of the milking process from cow to bulk tank.

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### **USPHS COMMISSIONED OFFICER STUDENT TRAINING AND EXTERN PROGRAM**

The professional sanitarian category has been included for the first time by the Public Health Service, U. S. Department of Health, Education and Welfare, in its Commissioned Officer Student Training and Extern Program (COSTEP). It is anticipated that several professional sanitarian COSTEP billets will be approved for the summer of 1968. Interested persons should seek additional information from about this unusual professional training opportunity from their sanitary science facility advisor.

According to the criteria used in appointing COSTEP officers, applicants must: (a) Be a citizen of the United States; (b) Meet physical standards of the Service; (c) Fulfill ordinance standards established by the Service; (d) Have completed at least 2 years of a baccalaureate program at time of assignment; and (e) Be recommended by a dean or department head of the student's college or university.

Applicants will be given preference who: (a) Have completed the third year of study in a sanitary science curriculum before effective date of assignment; (b) Expresses an interest in continuing postgraduate work to obtain a qualifying Master's degree for the Commissioned Corps of the Service; (c) Are above average academically (above 3.0 average out of 4 grade points or in the upper one-third of his class); and (d) Has been given above average recommendations.

The COSTEP program of the Public Health Service enables students who are planning careers in health to gain productive, worthwhile experiences in their professional field. Successful applicants will be assigned to specific duties tailored to their interest and ability. While on duty, the COSTEP officer will be supervised and counseled by senior members of the professional staff.

The Public Health Service will reimburse the COSTEP for his travel to the assigned duty station and return. During the tour of duty, the COSTEP will be entitled to pay and privileges of a junior assistant Health Service Officer, a grade corresponding to a Navy Ensign or Army 2nd Lieutenant.

Duty assignments for COSTEP officers are available throughout the year but the largest number

participate in the program during the summer months. The length of assignment is for not less than 31 nor more than 120 days in any 12 month period. Applications should be made at least 6 months before an availability date or for summer COSTEP positions applications must be received by the Office of Personnel not later than October 1 for the following summer.

The Division of Indian Health of the Public Health Service participates in the COSTEP program and provides unusual opportunities for the student trainee in its wide range of activities—evaluation of sanitary conditions effecting the health of Indians, motivation of Indian people to participate in Tribal-Federal sanitation facility construction activities, training recipients of completed facilities in care, maintenance and use, consultation with Indian Tribal groups, and work experiences in multi-discipline approach to solving health problems.

Persons interested in such appointments should discuss the COSTEP program with their principal advisor in sanitary science. Application forms and additional information will be available from them.

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### **CORNELL CONFERENCE AND SHORT COURSE ON CULTURED DAIRY PRODUCTS**

A nation-wide conference on cultured dairy products will be held at Cornell University, Oct. 2-4, 1967. More than 200 management personnel from major dairy manufacturing firms throughout the country, dairy scientists, and plant superintendents are expected to attend the event.

Sponsored by the N.Y. State College of Agriculture, Cornell, the three-day parley will coincide with the annual meeting of the American Cultured Dairy Products Institute.

In cooperation with the Institute, the College of Agriculture also plans to hold a three-day short course on cultured dairy products, October 4 through 6. The number of participants in this clinic will be limited to 20, mostly plant supervisors and production personnel, according to David K. Bandler, dairy extension specialist at Cornell and program chairman for these events.

Emphasis on this year's conference is on dairy plant waste disposal. Utilization and disposal of acid cheese whey, a major by-product of cheese, will be examined in a day-long symposium.

The program also features talks on lactic cultures for dairy products such as cheese, buttermilk, sour cream, and yogurt. Elimination of spoilage in cottage cheese, milk flavor problems, and packaging

cottage cheese with nitrogen gas will be discussed.

Other topics include the influence of the Food, Drug and Cosmetics Act on new techniques for fermented and acidified products, and certification under the U. S. Public Health Service pasteurized milk ordinance to sell dairy products to the government. A panel discussion on regional differences of flavor and body in cottage cheese also will be featured.

### PHS ENVIRONMENTAL SANITATION SECTION MOVES TO CINCINNATI

As a part of a general reorganization of the U. S. Public Health Service, the Environmental Sanitation Program including milk and food protection, has been transferred from its former offices in Washington, D. C. to a new location in Cincinnati, Ohio. It now becomes a part of the National Center for Urban and Industrial Health, a newly created arm of the Public Health Service charged with eliminating health hazards associated with urban living.

The Center, one of the major operating units of the Service's Bureau of Disease Prevention and Environmental Control, was created in January. Establishment of the Center in Cincinnati brings together in one location numerous Public Health Service programs involving research, training, and technical and financial assistance in such environmental health fields as solid waste management, prevention of occupational illness, control of injury hazards, milk and food sanitation, health implications of the use of water and sea resources, and environmental engineering.

One Center activity, the Arctic Health Research Laboratory, will continue to function at its new facility adjacent to the University of Alaska at Fairbanks.

The move of the National Center from temporary headquarters in the Washington area to rented facilities in Cincinnati is the first step in a program that will eventually find the Center housed in permanent facilities on the campus of the University of Cincinnati.

The University is now developing a major environmental health program under a grant from the Public Health Service. It has made available a tract of land close to the main University campus on which will be built a facility to house the National Center for Urban and Industrial Health. Completion of the building is still several years in the future.

Commenting on the Center's move to Cincinnati, Dr. William H. Stewart, Surgeon General of the Public Health Service, said: "We Americans have constructed an environment that provides us with unprecedented comfort and convenience. But in doing so, we have also brought into existence health hazards that were unknown to previous generations.

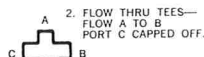
"The new Center will help people in the cities and work places to avoid these environmental hazards, to correct them, and to prevent new hazards from arising. It will be concerned with such problems as the reduction major of injuries, suffered by one fourth of our population, the prevention of respiratory and other diseases associated with certain kinds of occupation and work environments; the safety of drink-

### NADEM SUBGROUP PREPARES DATA ON SS TUBING AND FITTINGS

**LOSS OF HEAD DUE TO FRICTION IN FEET PER FOOT OF STAINLESS STEEL TUBING AND IN FEET FOR SANITARY FITTINGS.**

Capacity G.P.M.	O.D. — 1"			O.D. — 1 1/2"			O.D. — 2"			O.D. — 2 1/2"			O.D. — 3"			O.D. — 4"		
	I.D. — .902"	I.D. — 1.402"	I.D. — 1.870"	I.D. — 1.870"	I.D. — 2.370"	I.D. — 2.870"	I.D. — 3.834"	I.D. — 4.762"	I.D. — 5.762"	I.D. — 6.762"	I.D. — 7.762"	I.D. — 8.762"	I.D. — 9.762"	I.D. — 10.762"	I.D. — 11.762"	I.D. — 12.762"	I.D. — 13.762"	I.D. — 14.762"
	Tee	Elbow	Tee	Tee	Elbow	Tee	Tee	Elbow	Tee	Tee	Elbow	Tee	Tee	Elbow	Tee	Tee	Elbow	Tee
2	.01	.01	.1															
4	.025	.02	.2															
5	.035	.025	.25															
10	.12	.06	.4	.02	.01	.15	.005	.015	.1									
15	.25	.1	.8	.04	.02	.25	.013	.02	.15									
20	.43	.22	1.5	.06	.03	.3	.02	.025	.2	.005	.02	.1	.003	.02	.06			
25	.66	.4	2.3	.08	.04	.4	.025	.03	.25	.006	.03	.15	.004	.03	.08			
30	.93	.7	3.3	.105	.05	.55	.035	.05	.3	.008	.05	.2	.005	.04	.1			
35	1.22	1.25	5.2	.135	.05	.8	.04	.06	.4	.011	.06	.25	.006	.05	.13			
40				.17	.11	1.0	.05	.08	.5	.015	.07	.3	.007	.06	.15			
45				.21	.16	1.3	.063	.1	.6	.02	.09	.35	.008	.065	.18			
50				.25	.2	1.6	.073	.12	.7	.022	.1	.4	.01	.07	.2			
60				.34	.25	2.2	.1	.18	.9	.03	.12	.45	.015	.08	.25			
80				.57	.36	3.7	.16	.3	1.5	.05	.15	.55	.02	.1	.4			
100				.85	1.35	5.8	.23	.44	2.3	.075	.18	.6	.03	.11	.5	.008	.04	.1
120				1.18	2.05	9.1	.32	.64	3.3	.105	.21	1.0	.04	.13	.6	.01	.05	.15
140							.42	.85	4.5	.14	.23	1.25	.05	.16	.8	.013	.06	.2
160							.54	1.13	5.8	.17	.28	1.6	.07	.2	1.1	.015	.07	.25
180							.67	1.45	7.4	.205	.31	2.0	.08	.21	1.3	.02	.08	.3
200							.81	1.82	9.0	.245	.35	2.5	.1	.26	1.6	.025	.09	.4
220							.95	2.22	11.0	.29	.41	3.0	.12	.3	1.9	.028	.1	.5
240							1.10	2.63	13.5	.34	.48	3.7	.14	.33	2.2	.035	.11	.55
260										.39	.53	4.5	.155	.39	2.5	.04	.115	.6
280										.45	.61	5.3	.19	.42	2.8	.045	.12	.65
300										.515	.7	6.2	.22	.5	3.1	.05	.13	.7
350										.68	1.05	8.5	.28	.67	4.1	.07	.15	.9
400										.86	1.55	11.0	.36	.88	5.2	.085	.18	1.2
450										1.05	2.25	13.5	.44	1.1	6.6	.105	.2	1.5
500										.54	1.4	8.0	.13	.23	1.75			
550										.64	1.7	9.5	.15	.27	2.1			
600										.75	2.05	10.2	.175	.3	2.5			
650										.87	2.41	13.0	.2	.34	2.8			
700										1.0*	2.8	15.0	.23	.4	3.4			
750													.26	.43	3.8			
800													.3	.5	4.4			
850													.33	.56	5.0			
900													.37	.62	5.7			
950													.41	.7	6.3			
1000													.45	.8	7.0			
1100													.53	1.06	8.6			

NOTES: 1. FOR ELBOWS—R/D=1.5  
3. TEST MEDIUM—WATER AT 70° F



PREPARED BY MEMBERS OF THE SANITARY PUMP SUBGROUP OF N.A.D.E.M.  
PUBLISHED THROUGH COURTESY OF THE NATL. ASSN. OF DAIRY EQUIPMENT MANUFACTURERS  
1012 Fourteenth Street, N.W.  
Washington, D. C. 20005  
JUNE 1967

Members of the Sanitary Pump Subgroup of the National Association of Dairy Equipment Manufacturers have assembled data and have released a table showing "Loss of Head Due to Friction in Feet per Foot of Stainless Steel Tubing and Sanitary Fittings." Recently the data was furnished members of the Committee on Sanitary Procedures to be used as a standard for the purposes indicated.

Believing that the information will have wide interest and application, the table is reproduced herewith.

ing water, milk, and food; and the improvement of the Nation's efforts to dispose of solid wastes without causing hazards to health."

Much of the technical staff and programs now a part of the Center have been located in Cincinnati for many years. The move to Cincinnati which was completed on July 31, shifted to Ohio the Office of the Center Director, the Center's grants program, and the top administrative staff for each of the operating programs, with the exception of Arctic Health.

Director of the Center is Jerome Svore. Deputy Director is Paul W. Kabler, M.D., the Associate Director is Murray Brown, M.D., and the Assistant Director is Howard Kusnetz. They will supervise the following programs:

Solid Wastes (garbage and other refuse disposal) — Chief, Richard Vaughan. Mr. Vaughan replaces Leo Weaver, who will be attached to the Center's liaison office in Washington.

Environmental Sanitation (milk and food protection, sanitation in the home, in recreation, in schools) — Chief, Robert E. Novick, formerly the program's regional representative in Chicago. Mr. Novick replaces Mr. Vaughan as Chief.

Water Supply and Sea Resources (standards of safe drinking water, health aspects of water pollution control, and shellfish sanitation) — Chief, Curtiss M. Everts, formerly the solid wastes regional representative in San Francisco. Mr. Everts replaces Frederick S. Kent, who will be attached to the Center's Washington liaison office.

Injury Control (the prevention of all injuries) — Chief, Richard E. Marland, Ph.D.

Occupational Health (the prevention of disease or disability caused by such hazardous working conditions as industrial dusts, chemicals, heat, cold, noise and vibration) — Chief, Dr. Murray C. Brown.

Arctic Health (mitigation of the effects of severe cold on health) — Chief, Edward Scott. The program is operated at the National Center's Arctic Health Research Laboratory, Fairbanks, Alaska.

The Cincinnati address of NCUIH is 222 East Central Parkway, 45202.

### CONFERENCES SCHEDULED AT UNIVERSITY OF MARYLAND

The schedule of dates for the 1967-68 conference season of Dairy Technology short courses and conferences at the University of Maryland has been completed. The dates are as follows:

23rd Annual Dairy Technology Conference, November 8, 1967

Ice Cream Short Course, January 22 through January 31, 1968

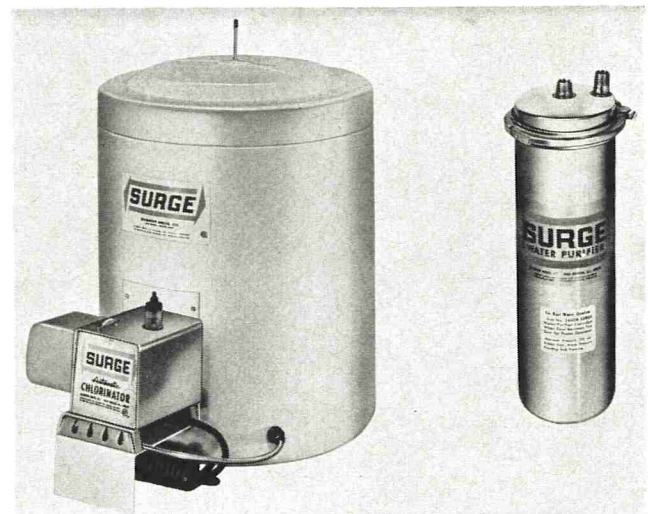
Ice Cream Conference, February 1, 1968  
Cottage Cheese and Cultured Milk Products Symposium, March 13, 1968

For further information, contact Wendell S. Arbuckle, Department of Dairy Science, University of Maryland College Park, Maryland.

### INFORMATION FROM INDUSTRY

**Editorial Note:** Following are items of information on products, equipment, process and literature based on current news releases from industry. When writing for detailed information, mention the Journal.

### NEW SURGE WATER TREATMENT EQUIPMENT



Babson Bros. Co. have broadened their sanitation line to handle the purification of water systems. They have recently introduced the Surge Automatic Chlorinator and the Surge Water Purifier.

This new equipment enables farmers to have a safe water supply through continuous disinfection such as is found in most cities and municipalities. It handles problem waters such as iron, bacteria or hydrogen sulphide and also treats pond or cistern water. The Surge purifier removes all objectionable odors (including chlorine) and filters particles of 1 2/25000 inch to make "bottle quality" water available through the kitchen tap.

Besides eliminating many health hazards to the farm family itself, purified water helps assure their rating with authorities if they produce milk or other foods that are controlled by the Health Department.



## NEW ANTISEPTIC HAND SOAP



Scroap, an antiseptic scrub soap, has been introduced for use by processing personnel who are in contact with food surfaces. Approved by regulatory bodies for use in food plants according to the manufacturer, Klenzade Scroap will reduce the bacterial flora of skin with continued usage. It utilizes hexachlorophene as a bacteriostat agent which will build up a protective residual on hands. Scroap is part of a total Klenzade hand care program for food personnel. It is available in four-one gallon cases. For further information, write Klenzade Products, Division of Economics Laboratory, Inc., Beloit, Wisconsin 53511.

### FLAVORIZERS REMOVE OFF-FLAVORS AND ODORS

Cherry-Burrell Corp., Cedar Rapids, Iowa, announces a broad line of Aro-Vac Flavorizers to remove off-flavors and odors from milk products. Three models are designed for vacuum only operation to eliminate mild off-flavors and odors; two models, for steam and vacuum operation, eliminate stronger off-flavors and odors; and three more, also steam and vacuum operated, are designed to rid milk of intense feed, weed and other volatile off-flavors and odors.

Various models can be used with HTST or batch pasteurizing systems. All are designed for automatic operation, requiring operator attention only to start and stop. In all models the vacuum chamber is positioned for easy cleaning. Clean-in-place fittings are used throughout.

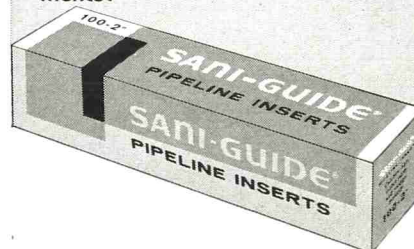


## SANI-GUIDE® PIPELINE INSERTS

### CHECK SEDIMENT BEFORE IT GETS INTO YOUR MILK SUPPLY

- Sani-Guide catches hair, insects, fluffy filter lint, and other foreign matter
- Gives visual proof of cleanliness
- Low-cost protection against pump-damaging objects
- Prevents air leaks, foaming, costly milk seepage
- Easy to insert in the sanitary union between bulk tank outlet and truck hose

Only KENDALL makes this effective after-filtering insert . . . recommended and used by leading dairy plants and health departments!



**THE KENDALL COMPANY**  
FIBER PRODUCTS DIVISION  
WALPOLE, MASSACHUSETTS

Makers of KENDALL non-gauze Milk Filters  
and KENDALL Animal Health Products

# JOURNAL OF MILK AND FOOD TECHNOLOGY

## INSTRUCTIONS TO CONTRIBUTORS

The *Journal of Milk and Food Technology* is designed primarily for the publication of scientific and technical papers dealing with milk and food science, sanitation, and technology as well as with public health problems related to the production of dairy products and other foods. Other subjects in the areas of environmental health and sanitation are also suitable for publication as are papers dealing with laboratory procedures used to evaluate the sanitary quality of foods, food production facilities, or other environmental conditions.

Manuscripts are accepted, subject to editorial review. Authors are notified when a manuscript is received and also when it is submitted to the printer. Membership in the International Association of Milk, Food, and Environmental Sanitarians, Inc. is *not* a prerequisite for acceptance of a manuscript for publication.

Papers, when accepted, become the copyrighted property of the Journal and can be reprinted only through arrangement with the Association Office.

All manuscripts should be submitted *in duplicate* by first class mail in flat form to the Editor, Dr. E. H. Marth, Department of Food Science and Industries, University of Wisconsin, Madison, Wisconsin 53706.

## PREPARATION OF MANUSCRIPTS

1. The *Style Manual for Biological Journals* (published by the American Institute of Biological Sciences, 3900 Wisconsin Avenue NW, Washington, D. C. 20016) has been adopted as a guide for authors in the preparation of manuscripts submitted for publication.

2. All manuscripts should be typed double-spaced on 8½ by 11-inch bond paper. Lines on each page should be numbered (in the left hand margin) to make review of papers easier. Use of paper with pre-numbered lines is satisfactory. Side margins should be one inch wide. Pages should not be stapled together. Before a manuscript is submitted it should be read by someone other than the author(s) in order to eliminate errors and clarify statements.

3. The title should appear at the top of the first page followed by the author(s) name(s) and affiliation(s). Titles should be as brief as possible, contain no abbreviations, and be truly indicative of the subject matter discussed in the paper. Care should

be exercised by authors in preparing titles since they are often used in information retrieval systems. *Good information can be lost through a poor title.*

4. Manuscripts reporting the results of experimental work generally should be organized as follows (in the order indicated): summary or abstract; an introductory statement of the problem and objective(s) of the work; methods or procedures; results and discussion (separate or combined); conclusions (only if needed and if different from the summary); acknowledgements, if any; and references.

5. General discussion type manuscripts should be divided into sections with appropriate sub-titles descriptive of the subject of the particular section.

6. Figures consisting of drawings, diagrams, charts and similar material should be prepared in India ink on tracing paper, white drawing paper or blue linen. Sheets should not exceed 8½ by 11-inches. Do not use paper with green, red or yellow lines. *Titles for all figures must be on separate sheets.* A letter guide should be used for all lettering on figures. Submit original figures rather than photographs of them.

7. Tables should be typed on a separate sheet of 8½ by 11-inch bond paper; place only one table on a sheet. Use Arabic numbers for numbering of tables. *Titles should be as brief as possible but fully descriptive.* Heading and subheadings should be concise with columns or rows of data carefully centered below them. Use *only* horizontal lines to separate sections of tables. Data in tables should not be repeated in figures.

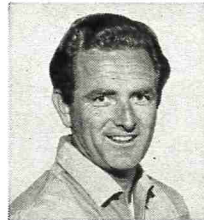
8. Refer to the *Style Manual for Biological Journals* for correct abbreviations and punctuation for titles of periodicals and for biological, chemical, physical, mathematical and statistical terms.

9. References should be arranged alphabetically by author(s). Use initials rather than full first and middle names. Reference citations in the text should be given by the number in parentheses corresponding to that number in the list of references. For guidance in the form of listing references, see a recent issue of the Journal.

10. News items and announcements should be typed double-spaced with an appropriate title given at the top of the item. News of the activities of affiliate associations, members and events is particularly desirable. *Letters to the Editor are encouraged;* such letters must be signed by the writer.

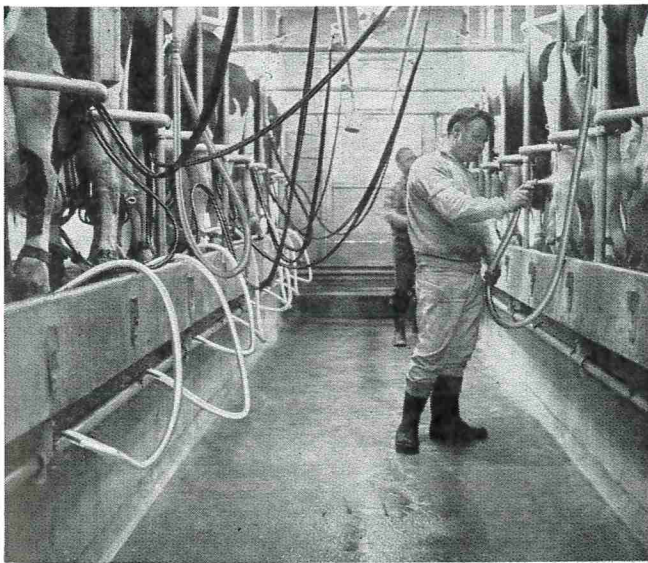
# "We've converted 100% to Transflow M-34R plastic milk hose and vacuum lines"

says Harold Tollerup,  
Corona, California,  
dairyman



# "We'll never use rubber again"

adds John Mann,  
Tollerup's foreman



Above. A portion of the pit in Tollerup's herringbone barn. (The dairy also has a conventional barn.) Note TRANSFLOW connected along left side. "With TRANSFLOW's clearness you can see the cow's milk flow. I'm sold on TRANSFLOW," says foreman John Mann.

Alert, successful, businesslike . . . Tollerup Dairy milks 862 Holsteins every day. Its milking machines are all equipped with clear, flexible TRANSFLOW M-34R Milk Hose and TRANSFLOW Vacuum Tubing.

"It's lots cheaper than rubber because it lasts a lot longer," Tollerup says of his TRANSFLOW. "It's less trouble, too."

Foreman John Mann agrees. "It doesn't crack, and when you accidentally bend the hose during milking it doesn't pinch like rubber will. Also, it doesn't crack, and no black rubs off as happens with rubber. It's easy to handle, too. I'm sold on TRANSFLOW®."

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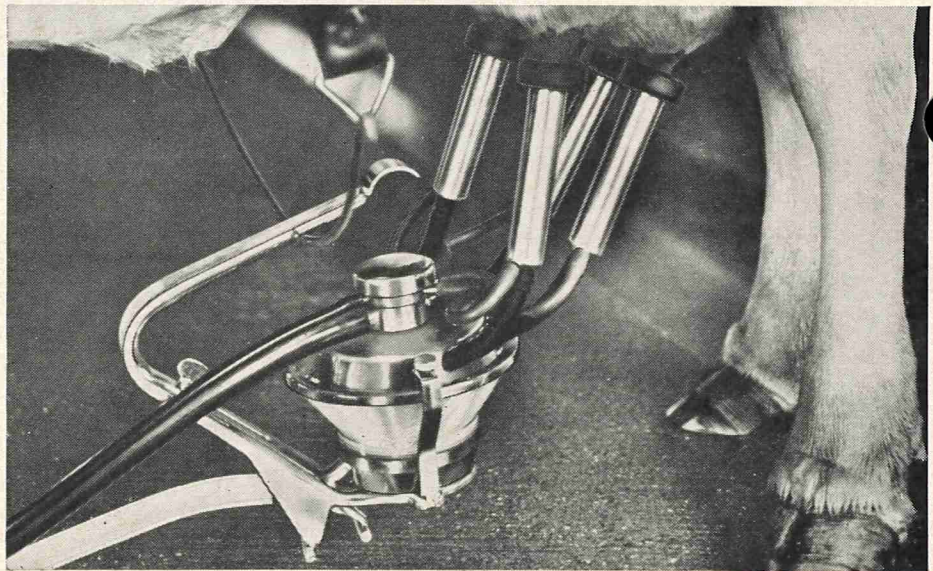


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