Operation of Patterson Creamer

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Recent Developments in

Processing Honey for Soft, Smooth Grain

A NEW type of honey agitator designed by the author to improve the spreadability of honey and also produce a very smooth-grained texture in the product is described in this article by C. R. Paterson, Apiculturist, Department of Agriculture, Hamilton. This machine was first demonstrated 2 years ago, and trials since then have given definite results provided certain procedures are followed.

THE best way to eat honey, as directly stored by the bees, is in the natural honeycomb. However, commercial beekeeping has been built up on the production and sale of honey removed from the beeswax comb. This is done by extracting the crop of honey by centrifugal force from the combs in which the bees store it.

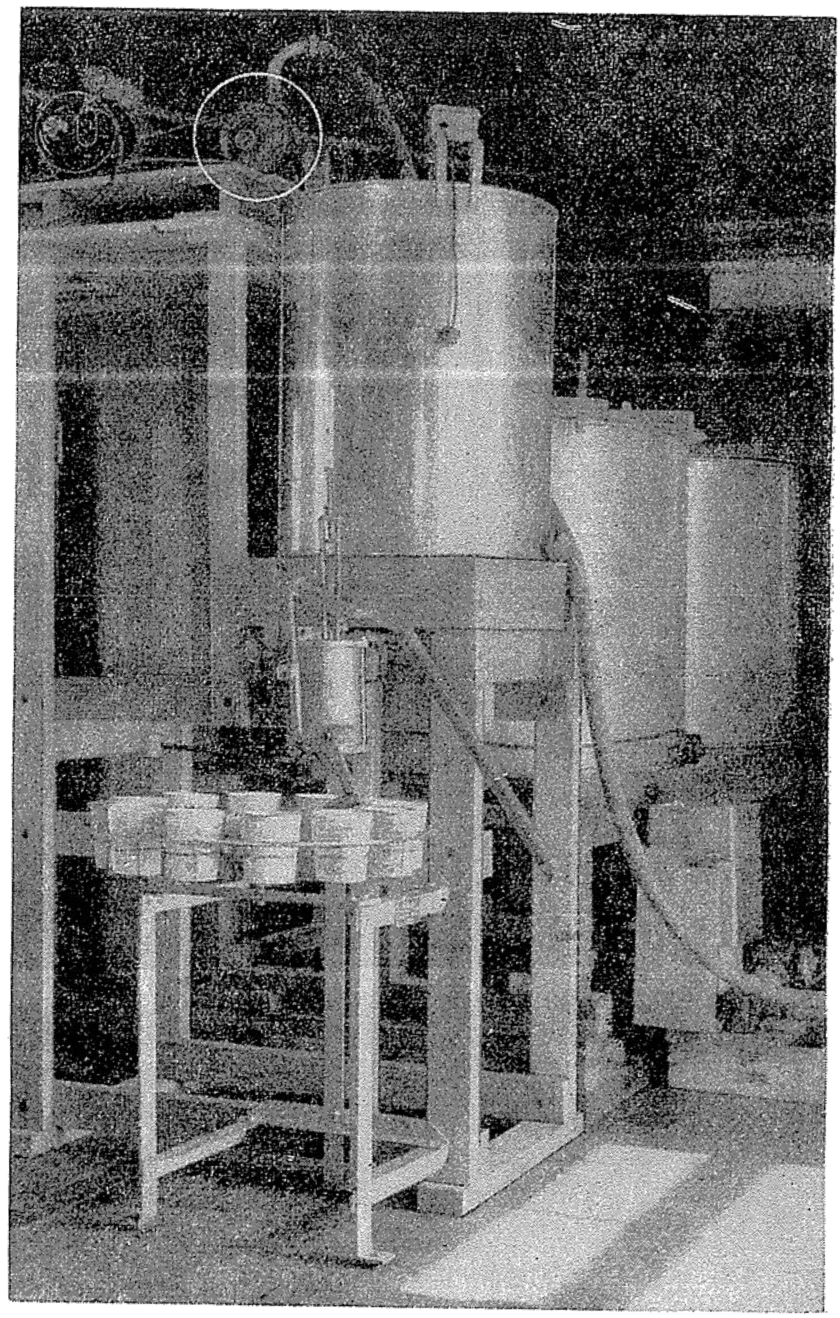
Most honey, if left for a few weeks after extraction, would soon begin to granulate and in a month or so would go quite sugary. The average consumer of honey does not like it in this condition, so competent beekeepers process their honey to prevent these coarse sugary crystals from forming. There is no secret in this process, as it is simply a matter of temperatures, the addition of a small amount of really smooth-grained honey (starter), and adequate stirring. Nothing else is added because it is not necessary to do so.

All honey contains a certain amount of water which varies according to climatic conditions, the district, and the kind of flowers the bees are working. The maximum safe amount in New Zealand honey is 17.2 per cent, yet in some areas the amount may be as low as 15 per cent. The water content of honey has a direct bearing on the general condition and its reaction to any processing method.

Faults in Present Methods of Granulation

1. Honey with a low water content of the type usually produced in the warm, dry districts of New Zealand, usually sets very hard after granulation. In this condition it is very difficult to spread and many spoons have been bent and many knives broken in trying to get this kind of honey out of its container. Housewives are very reluctant to buy honey like this if something softer and more spreadable can be found.

2. Unless great care has been taken in the handling of the honey during



A honey creamer (in circle) incorporated into a set-up normally packing honey with a low water content. The pump which lifts the honey to the creamer is at lower right.

packing, white streaks often show up very prominently after storage for a month or so. This is known as dry granulation, and though it does not affect the quality of the honey as a table delicacy, it certainly detracts from the general appearance of the product.

3. Supplies of starter honey have to be kept for the season's packing. In some instances starter honey is carried over from the previous season, and very often by the time it is used is not in the best condition.

4. In many instances normal stirring methods do not give this very smooth texture to the honey because temperatures are not right. This is why it is so difficult to produce a smooth-grained honey during the warm, summer months unless practical methods are used in reducing the temperature of the honey during the granulation process.

Methods Tried

Experiments were carried out to see if present methods of processing honey could be improved.

It was known that stirring of the honey was important in granulation, so some time was spent in analysing the possibilities of improving on the various types of stirrers in use. However, a larger machine and a more powerful motor could not be considered because of cost.

High-frequency vibrations at first appeared to offer possibilities, but here again the high cost of an installation eliminated this method for practical use.

As honey pumps are now almost standard equipment in most honey houses, it was thought that they could be used to give the honey that extra agitation. Several plates with very fine holes were placed on the delivery side of a honey pump. It was thought that if semi-granulated honey was taken from the processing tank by the pump and then forced through the series of small openings, a general break up in the texture of the honey would be attained. Trials with this method gave a definite improvement in the texture of the honey compared to that of the control samples.

While these experiments were being carried out the author thought of subjecting a small amount of honey to severe agitation on the same principle as the standard stirrer. Because of the small amount of honey in the unit a much higher speed could be used while still making use of a smaller powered electric motor.

In the first trial the agitator unit was attached to an open 60 lb. honey tin. Liquid honey was placed in the tin and 5 per cent starter was stirred in to the honey with a stick. Next day some honey was run through the machine and a sample compared with the control. Practically no difference could be detected in the two samples. Results were very similar for the next 3 days. After this a decided change could be noticed. When the honey in the tin was so firm that it had to be moved away from the sides of the tin by a stick, the final sample came out like thick cream.

A comparison of all samples several weeks later seemed to indicate that the small agitator method offered the best prospects for a general improvement in creamed honey. Also the method was simple and could be worked as an "in-line" unit when packing, and the cost would be reasonably low for its installation.

Further trials showed that air could be injected under control, and the result was a very desirable type of starter honey.

Results of Trials

The checking of many samples run through this agitator or creaming machine gave the following results:

1. The machine must be run at a high speed, 750 to 850 r.p.m.

2. No definite results are obtained until the honey to be processed has reached an advanced stage of granulation, that is, will just run into the machine.

3. Honey with an exceptionally low water content requires more agitation, which can be attained by running the honey through at a slower rate.

4. Honey assumes a creamy, buttery texture and never sets brick hard.

5. Owing to the friction created during agitation a temperature rise of from 5 to 8 degrees F. can be expected.

6. This warming of the cold honey allows it to be easily packed into the various-sized containers without showing any of the streakiness so often seen in honey packed in an advanced stage of granulation.

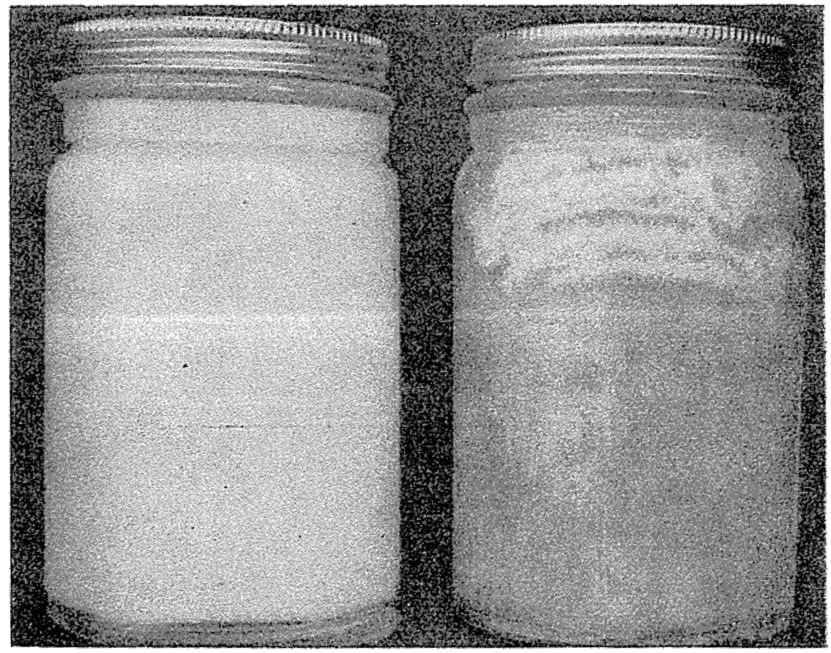
7. The honey settles down evenly in the container and offers a smooth top surface when the lid is taken off the package.

8. Though dry granulation has often shown up in the control samples, none has ever been noticed in any samples from the agitator.

9. Because of the severe agitation of the honey in this unit its general structure must undergo some change, because honey so treated is less hygroscopic. This honey when placed in a dish for table use does not appear to absorb moisture to the same extent that ordinary honey would do under humid conditions.

10. Honey when run through very slowly with the admission of a small amount of air makes ideal starter honey, which has the ability to mix readily into cold honey and at the same time hasten granulation. This is no doubt due to the increased number of fine crystals.

11. Smears of honey checked under a microscope have shown that crystal formation is completely broken up. However, this unit will not break



The honey on the left has been through the honey creamer, and that on the right, showing dry granulation, has had normal stirring.

down strong crystal formation because it has a limited abrasive effect.

Another important factor is the popularity shown by honey eaters for this type of processed honey.

12. Satisfactory results will not be obtained if the honey is too warm. Honey temperatures around 65 degrees F. are desirable.

Installation of Agitator

A 1 h.p. electric motor is required to drive this agitator.

As the speed of the agitator shaft is about 800 r.p.m., the pulley on the motor should be 3½ or 4 in. in diameter. This gives a pulley with a reasonable amount of belt grip.

For honey with a normal water content the machine can be coupled to the underside of the stirring tank and then on to the filling machine as shown in the drawing at right. The motor is controlled with the same switch as is used for the filling machine. However, arrangements should be made so that it can be operated separately when starter honey is being specially processed.

A set-up recommended for dealing with honey of a low water content is shown in the photograph on page 513. Here the honey is taken from the stirring tank by a honey pump and then through the agitator, which rests on top of a small holding tank. The filling of containers is done from this tank, and the level of creamed honey can be controlled by an automatic switch which controls both the pump and the agitator.

Operating Instructions

Because honey varies greatly in composition and water content, it is not possible to give a standard method of processing it with this type of agitator. Each beekeeper will have to develop a set-up most suitable for his own requirements.

The essential operating features are:

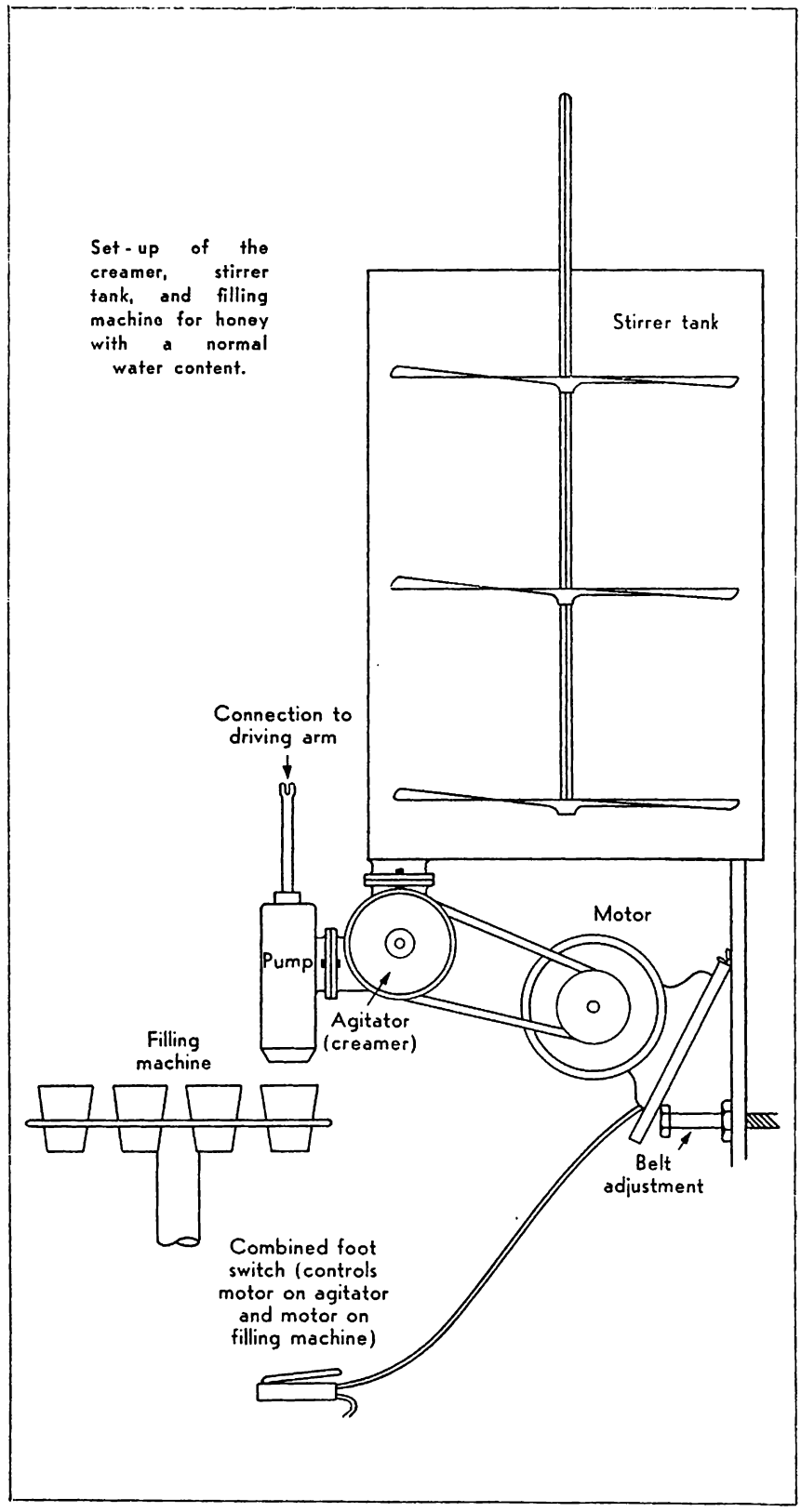
1. Assist initial granulation by adding about 5 to 10 per cent good, smooth-grained starter and then give the required amount of stirring.

2. Do not attempt to cream honey until granulation is well advanced and the honey will just flow.

3. The rate of flow through the agitator will have a direct bearing on the consistency of the honey.

4. This rate can often be increased by adding more of this specially creamed honey as starter. In fact several beekeepers are finding that they can turn out an improved pack simply by using the agitator for the processing of starter only. Because of a plentiful supply of starter much more can now be used, 15 to 20 per cent.

5. Do not attempt to cream warm honey. Temperatures around 60 to 65 degrees F. appear satisfactory.



6. For a good, soft, creamy honey it is not necessary to allow entry of any air. However, experience will show if admission of air causes improvements. In many instances the amount of air incorporated in the honey is not as much as that mixed in by the many types of stirrers now used. If the creamed honey is occupying more space in the container than usual, too much air has been added.

7. Because of the severe agitation the honey is subjected to, pockets of air in the honey are broken up into very fine particles. This is what accounts for the non-appearance of dry granulation in the creamed honey.

8. Air intake can be checked by removing the control screw when the agitator is operating and placing a finger tip over the opening, when a definite suction can be felt.

9. To secure a supply of starter honey let the honey run through the agitator at a slower rate. Place the honey in a cooler for a day or so, when it can be used as starter for the next tank lot.

10. Because the temperature of the honey as it passes through the agitator is raised about 5 to 8 degrees F., it is best to place filled containers immediately in the cool room. Generally about 2 days is enough to allow sufficient set before the honey is sent out to merchants.

11. Do not run the agitator for long periods without honey; otherwise you may get excessive wear on the bearings. Also drain the machine after use, and before starting up again make sure the spindle is free.

This type of agitator is not a honey pump, but a machine designed to give honey the maximum amount of agitation or creaming in the shortest possible time.

In all experimental work it was found that a general improvement in texture was noticeable in tests carried out when the desired stage in granulation had been reached.

It has also been found that honey subjected to this creaming process did not break down under normal summer temperatures.

Construction

There is nothing complicated in the construction of this type of creamer or agitator, and it is understood that machines of this pattern are already being manufactured at a very reasonable price. Your local Apiary Instructor will be able to advise you where they are procurable, and further details on construction and installation can be obtained from the Apiculturist, Department of Agriculture, Hamilton.

Dr M. B. Buddle Appointed Superintendent at Wallaceville

DR M. B. BUDDLE, Senior Veterinary Research Officer, Department of Agriculture Animal Research Station, Wallaceville, has been appointed Superintendent of the Station in succession to Dr I. J. Cunningham.

DR BUDDLE has an international reputation in research and has made outstanding contributions in the field of microbiology and animal disease.

Born in 1914 in Australia Dr Buddle graduated B.V.Sc. with honours in 1936 and joined the New Zealand Department of Agriculture in January 1938.

He was awarded a D.Sc. by the University of New Zealand in 1956 for a thesis describing outstanding work on a family of bacteria.

In 1953 he was awarded the first Underwood Fellowship granted by the United Kingdom Agricultural Research Council, which enabled him to undertake a year's research at the University of Cambridge on causes of one of the genital diseases in sheep.

For the past 5 years Dr Buddle has been leader of a section at Wallaceville engaged in research projects on bacteria causing animal diseases. He has directed investigations into blackleg and pulpy kidney of sheep and cattle, contagious abortion of cattle, epididymitis of rams, mastitis, Johne's disease, and salmonellosis.

His application of a vaccine to the control of contagious abortion in cattle was a major contribution to the dairy industry. To study developments in investigation of contagious abortion in particular and of other bacterial diseases of livestock Dr Buddle in 1946 visited research institutions in the United States, Canada, and the United Kingdom.

Dr Buddle.

Dr Buddle's work on the causes and control of blackleg resulted in the development of a greatly improved vaccine. He also developed a new double vaccine for the control of epididymitis in rams. His eminence in this particular field of research was recognised by his being appointed to a joint FAO-WHO Expert Committee on Brucellosis.

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during September 1958 and for the 2 months ended 30 September 1958 with comparative figures for the same month and the 2 months of 1957 have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:

BUTTER

Period	Creamery (tons)	Whey (tons)	Total (tons)	Percentage inc. or dec.
September 1958	19,902	268	20,170	—
September 1957	17,992	269	18,261	—
Increase or decrease	+1,910	—1	+1,909	+10.454
2 months ended 30/9/58	31,322	374	31,696	—
2 months ended 30/9/57	29,183	379	29,562	—
Increase or decrease	+2,139	—5	+2,134	+7.219

Butter in store at 30 September 1958 was 9,738 tons

CHEESE

Period	White (tons)	Coloured (tons)	Total (tons)	Percentage inc. or dec.
September 1958	5,417	1,328	6,745	—
September 1957	6,159	1,095	7,254	—
Increase or decrease	—742	+233	—509	—7.017
2 months ended 30/9/58	6,837	1,365	8,202	—
2 months ended 30/9/57	7,777	1,135	8,912	—
Increase or decrease	—940	+230	—710	—7.967

Cheese in store at 30 September 1958 was 8,946 tons

If these figures are converted into butterfat equivalent, there is an increase of 5.595 per cent in butterfat graded for the 2 months as compared with the preceding season. The above figures refer only to butter and cheese graded for export, and owing to diversions which may take place they are not necessarily a true indication of production trends.

HONEY CREAMER

ISSUED BY THE NEW ZEALAND DEPARTMENT OF AGRICULTURE