A modified copper hot water system

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A MODIFIED COPPER HOT WATER SYSTEM

A good supply of hot and boiling water for cleansing and sterilising utensils is essential for hygienic milk production. Dairy Instructor F. Fielder, M.D.D., describes an efficient and economical modification of a copper hot water system for this purpose.

SINGLE copper units of 14 or 16 gallon capacity to supply hot and boiling water for the dairy are no longer good enough for most dairy farms.

Dairy herds are getting bigger and a system which served a 20-cow herd with a two-stand milking plant is no longer sufficient for the 40-or-more-cow herd in a four-stand milking shed.

Increase—and Efficiency

To keep the increase in production on an efficient level, the equipment and basic facilities in the dairy must be maintained at a high standard. Unfortunately the provision of a system to supply abundant hot and boiling water for general cleansing and sterilisation in the dairy has been somewhat neglected and has often not kept pace with other improvements.

Poor Cleansing

Inefficient cleansing and sterilising often starts with the practice of replenishing the copper with cold water after removing a bucket of boiling water. This is particularly undesirable during the washing procedure. At this time there is not enough time for re-boiling, which means that sterilising is attempted with warm water only; the utensils remain greasy and damp and are in an ideal condition for invasion and contamination by bacteria, which leads to low quality produce.

THE MODIFIED SYSTEM

The answer to this problem is undoubtedly to install an approved dairy boiler which provides not only boiling water but steam under pressure for sterilising. If for any reason a boiler cannot be installed a simple and relatively inexpensive modification of the normally fitted hot water copper can prove a most efficient means of ensuring adequate hot water supplies for cleansing all equipment in the dairy. Such a system is described below.

Storage Tank

The first requirement is a suitable hot water storage tank. Although a copper storage tank would be more efficient and more durable, a 44-gallon drum in good condition will provide a satisfactory water storage. The effort and cost of replacing a 44-gallon drum every four or more years are of little consequence.

To maintain a high temperature in the stored water over reasonably long periods the tank must be insulated. Boiler lagging, asbestos fibre, brick or even sawdust will serve for this purpose.

The storage tank is bracketed to the wall or bricked in at a level above the existing copper. From an overhead water supply tank a three-quarter inch galvanised iron water pipe is connected to the lower plug hole in the drum.

Heating Coil

From an outlet at the base of the drum adjacent to the overhead pipe inlet (or from a T-piece at the pipe inlet) a water pipe is extended to the base of the copper fire box. At this point a three-quarter inch copper pipe is connected and fitted
The layout of the overhead supply tank A, and the insulated hot water storage tank B. C is the fire box and coiled copper piping for boiling and sterilising.
through the brick-work or iron frame of the copper. This copper piping is then coiled around the back of the fire box, in such a way that it will not interfere with the fueling of the fire. The longer the copper piping fitted in this coil the greater the heating surface, and the quicker the water in the holding tank will be heated. Copper piping must be used in the fire-box. Galvanised piping is good enough for the hot water lines and fittings although copper piping throughout would give longer service.

"Thermo Syphon"
The copper piping is extended upward through the housing of the boiler to connect with galvanised iron piping. At this point a tap is fitted for filling the copper boiler. Connection is then made to the top plug-hole in the drum, thus completing the circuit of a "thermo syphon" hot water system.

Safety Valve
A pipe line is extended through the roof of the shed to a height just above the water level in the supply tank. This ensures that the hot water tank is kept full and also acts as a safety valve for the tank. The hot water line is taken off this pipe as close as possible to the hot water tank.

**Advantages of the System**
The advantages of this combined copper-hot water system are:
- It is easily installed at low cost and is cheap to operate.
- Easy access to an open container of hot water is retained for immersing and sterilising utensils. This advantage is often lost with an ordinary hot water system.
- Water drawn from this container for washing and milking purposes is replaced with pre-heated water.
- Hot water can be taken to any point in the premises, and a reserve of hot water is in store for use at any time between milkings. This is obtained for no extra cost above that required to fuel the ordinary copper.
- The time-consuming effort of carrying buckets of hot water about the dairy from the copper boiler is eliminated.

**Quality Production**
Clean dairy utensils are essential for the production of high quality dairy products. Abundant supplies of hot and boiling water from an efficient system such as this reduces bacterial contamination of utensils and ensures better quality and higher grading.

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**Book Review**

**DAIRY CATTLE HUSBANDRY**

By D. R. LAMOND, B.V.Sc., M. Agr. Sc., Ph.D.

A GREAT NEED in dairy farming text books which apply to Australian conditions is fulfilled by Dr. Lamond's text, "Dairy Cattle Husbandry."

The chief source of dairying literature in the past has been England and America. This material is mostly written from a different point of view and based on findings not always applicable to Australian conditions, and West Australian conditions in particular.

"Dairy Cattle Husbandry" is written in a practical way. The author is a highly qualified worker in the field of dairy husbandry with a great deal of practical experience.

The book is well illustrated with diagrams and photographs. It contains a wealth of information presented in a manner easily understood and will certainly be of benefit to all those who are connected with the dairy cattle industry.

Farmers worried about the problem of solids-not-fat in milk will be particularly interested in the chapter on this important subject.

"Dairy Cattle Husbandry" is highly recommended as both a stimulating handbook for the practising farmer and a sound textbook for the student in agriculture.

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For pasture reclamation and the clearance of dense undergrowth, without fear of choking or damage, the use of the 6ft. unit by itself is recommended. The photograph above shows clearly the details of the HAYTER 6/14. For transport purposes the whole of each “wing” attachment can be swivelled back, thus reducing overall width to 10 feet. As with all HAYTER machines maintenance is confined to a small amount of on-the-spot replacements.

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