

ng done with tractors
urnish data is slightly
verage depth they had
was about 5 inches.
rdinarily considered as
ork, it does not appear
t on the crop yields,
ise were reported in a

or other work on plowed
lowing, depend largely
the skill of the operator.
il is usually more im-
on plowed land than in
serious drawback, with
tion of the Dakotas is
per cent. of Dakota
that their machines are
land.

depends to a very great
erator. Of 281 tractor
answered the question
ctors were out of com-
cent.) reported that
single day when needed
remaining 51 per cent.
ir tractors were out of
This average, however,
ted that their machines
rt of the time.

ota farmers reporting,
by the owner or some
results usually being
ators. Thirty-two per
d no time lost in the
outfit. This probably
not worth mentioning,
le so long as they know
or other irregularity in
to remedy it promptly.
the 68 per cent. report-
quarters of an hour.

HORSES.
kota farms, horses are
ut 57 per cent. of the
and where no increase
The tabulation of the
increase was made in
of the tractor showed
were displaced while
as before the purchase
up of 62 farms, with a
an average of 305 crop
es were kept before the
ly 406 horses are now
words, an average of
ere displaced on each
actor. On the second
l of 15,553 crop acres,
n, 409 horses are now
hase of the tractor.

wing the introduction
he only special equip-
s was the gang plow.
however, that a great
ines which could be
not sturdy enough for
use the latter is more
es, and machines used
ject to more sudden
ence during the past
has been given to the
and other machines
d the heavier service.
tain maximum results
implements designed
the objection of many
can not be used with
rk will probably cease
development of special
actor. There is con-
line of further in-
ttachments designed
tor. Many of these
or farm work, making
many field operations
nticable and uneconom-
ing work of the nature
s are often kept after
ith the development
med, it seems probable
tock will be displaced

depends upon many
ich is the proficiency
ives the outfit, both
e conditions under
s, whether on rough
oad it is required to
of the machine itself,
y tractors are kept
of charge during the
items as are caused
s not until the second
s the full expense.
akotas who had used
age age, 10 months),
nothing for repairs.
ng from a few cents
ng \$29, making the
up about \$19. The
outfits between the

ages of 13 and 24 months (average age, 19 1/4 months)
was \$40. For 49 machines between the ages of 25 and
36 months (average age, 33 months), average, repairs
amounted to \$97.

The figures reported for repairs indicate an annual
repair charge during the first three years of a tractor's
life of about 3 per cent. of the first cost, but this would
undoubtedly increase during the latter years of its life,
as is the case with most other machines. It would not
seem safe to expect the cost of repairs for a tractor to
average less than that for other farm machines, which
is a little over 4 per cent. of the first cost, and it is not
improbable that it will amount to slightly more than
this. In figuring the repair costs to be charged against
each day of use or acre plowed, the average annual
charge has been taken as 4 per cent. of the first cost.

PLOWING DONE PER ACRE.

The number of acres covered per day by a plow
drawn by a tractor is usually slightly greater than that
covered by the same sized horse-drawn plow. The acre-
age covered by two different machines, each pulling
the same number of plow bottoms, often varies con-
siderably, because they travel at different speeds, are in
different kinds of soil plowing different lengths of furrows,
etc. Theoretically a 14-inch plow when drawn by a
tractor should cover approximately 3 acres in an ordinary
working day of 10 hours, as the average plowing speed
is slightly more than 2 miles per hour. This holds true
in actual practice when the plowing conditions are
favorable, provided the outfit does not give trouble.
That is, a 2-plow machine should plow 6 acres and a
10-plow outfit 30 acres per day, provided both travel
at the average rate of speed and are kept moving. How-
ever, where trash, which frequently clogs the plows,
is to be turned under, each plow drawn by a large tractor
will cover much less ground, in a day than one drawn
by a small outfit, since the delays will naturally be in
proportion to the number of plows pulled. A delay
on account of 1 plow on a 2-plow outfit stops only 1
other plow, while on a 10-plow rig, for example, it stops
9 other plows.

According to the figures furnished by tractor owners
in the Dakotas, the area covered per day (10 net working
hours) in plowing with the tractors most commonly
used is 6.3, 8.5, and 10.9 acres for the 2, 3, 4-plow out-
fits, respectively.

The acreage covered per day in field operations
other than plowing will vary, of course, with the width
of the implement pulled, and this in turn will depend
upon the relative draft. The approximate acreage
covered in a day of 10 hours with implements of different
widths can be determined easily by allowing about 2
acres per day for each foot of the implement's width
where the outfit is working on soft ground. Where
it has a good footing it may be safe to allow 2 1/2 acres
for each foot of the implement's width. The acreage
covered, of course, will vary with different machines
owing to the different speeds, but the figures given are
based on a speed of 2 miles per hour, with an allowance
for time lost in turning and the slight overlapping,
which is a trifle greater in most other field operations
than in plowing.

By far the largest proportion of the work done by
tractors is in plowing and preparing the seed-bed and
in belt work. Though they are used for a number of
odd jobs at different times, these represent an insigni-
ficant portion of the total work. Hauling which usually
occupies farm horses for several days annually, is not
commonly undertaken with the tractor, and, in most
cases where it has been tried it has been found less satis-
factory and more expensive than hauling with horses or
trucks. To make an economical load for the tractor
it is necessary to have several heavily loaded wagons
and this makes an unwieldy outfit in turning corners
and in getting in and out of loading and unloading
places in most towns. Other objections to the use
of the tractor for hauling advanced by men who have
tried it are the heavy wear and tear on both tractor and
wagons on hard roads, expense on the unloaded return
trip almost as great as when loaded, and difficulty in
handling heavy loads on grades. It is not surprising
therefore, that only about 14 per cent. of tractor own-
ers report doing hauling with their outfits and that on
the whole, hauling represents less than 3 per cent. of
the work done by tractors in the Dakotas.

THE DAIRY.

Keep the calves on skim-milk or whey as long as
possible. It will pay in the better growth secured.
If they can continue to get milk for six or seven months
all the better.

When the calf is about two months old it may begin
to nibble a little corn silage. This may be fed more or
less freely, but the calves will not eat any appreciable
quantity until they are three or four months old.

Sometimes, when neither skim-milk or whey can be
secured, the use of hay tea is suggested. This is made
by boiling cut clover or timothy until a strong tea is
secured, which is fed in exactly the same manner as
milk.

Plan to keep the young calves in the stable until they
are at least six months old. Flies will bother them to
such an extent that they are likely to make poor growth
and the skin of a calf is not tough enough to enable it
to stand the hot sun.

It is good policy to grow all the roughages on the
farm that can be grown. These, together with the grain

that will be available from the farm, will furnish the
bulk of next winter's feed. The ration can then be
balanced with purchased feeds.

If it is to develop into a profitable cow or an animal
of good size and vigor, the calf must be kept growing
steadily from birth to maturity. A good growing heifer
should gain at least thirty pounds a month for the first
three months and from then on until she is a year old the
gain should be a little more.

One of the reasons why it is not advisable to put the
young calves on pasture until they are about six months
old is the fact that they require feed that is more con-
centrated than older animals. Grass is very bulky and
will prove uneconomical as a feed for the digestive
system of the young animal.

Do not breed the young heifers too early. The
proper age for breeding will depend somewhat upon
the breed, but in general it is not wise to breed until
they are at least twenty months old. Heifers of the
larger breeds that mature later should not be bred as
early as the smaller breeds.

If green crops are desired that can be cut and fed
to the cattle during the dry season, a mixture of one and
a half bushels oats and one-half bushel peas, per acre
is recommended. This mixture can be sown two or three
times, about two weeks apart, and afterwards a patch
of millet or Hungarian grass.

Clean Milk for Cheesemaking.

It has often been said that this is an age of standard-
ization and there is more truth than poetry in the state-
ment. Everywhere we are turning to the markets where
we sell our products for a guide as to what is required by
the consumer and this is becoming just as true of farming
as it is and has been true of manufacturing. For some
years it has begun to be realized that although there
still remains a very great deal to be learned about the
art of farming and growing crops and animals, we have
not paid sufficient attention to the question of marketing.
Co-operation has, therefore, taken on a new meaning
and everywhere there are evidences of the fruits of
co-operative marketing. But co-operation leads us to
new points of vision and allows us to get new per-
spectives of the business of farming, one of the most
important of which is an early knowledge of the fact
that if marketing is to be successful we must put on the
market what the market wants. The market is the



Soon Can this Scene be Duplicated on Hundreds of Farms.

consumer and the consumer always wants good products.
All consumers want the best of quality, but only part
of the consumers are able, or willing to pay. Nevertheless,
all will pay more for a good product than they will for an
inferior one and the obvious thing to do is to strive for
a good thing in the knowledge that in spite of our best
efforts there will be sufficient failures to provide enough
of the poorer products for those who will not or cannot
pay.

Cheesemaking is a tremendous big industry in
Canada and particularly in Eastern Canada. This
industry supplies a product which is of the highest
value as human food and a large part of it must find
a world market. In fact the almost absolute dependency
of the dairy industry of Canada upon the world's market
is a factor in the dairy farmer's success that is too little
realized. Most of us when we are not getting what we
realized. Most of us when we are not getting what we
think we should for our products want to know why,
but this is impossible unless we know something about
the market. The market tells us why our prices are
low or high and if low we can find out from the market
what is the matter with the product itself. Standard-
ization, or rather the lack of it, is one of the things that
has been lacking in our dairy products for many years
and we are just beginning to find out how serious a
detriment it is. We are learning, too, that although we
can begin at the marketable product and standardize it,
we must start back at the raw material with our stand-
ardization, or the percentage of the product that grades
high will be very small. This can only mean that before
we are through with standardization as a means of
giving the consumers what they want, we must get
back to the basis of cheesemaking and supply the cheese-

maker with milk of the best possible quality. How
to do this is the farmer's own problem, but he also
will find that extra precaution costs money and that
an extra price is necessary for better milk. The superior
product will partly provide this and co-operation will
also help, but the best method of getting pay for the
raw material of a quality actually produced is to adopt
the method of paying according to test and to insist
that only milk that is quite suitable for cheesemaking
be allowed to enter the vats. Eventually we must come
to some practical system of grading milk and cream
for the manufacture of such important foods as are all
our dairy products. The consumer will demand it and
he pays the bills. The farmer's own interests will make
it profitable to comply with this requirement for a good
product.

The principle question is how to get good clean milk
for the cheesemaker. Obviously this problem is up to
the farmer because the cheesemaker's liability can begin
only when he receives the milk. Cheese making is more
or less of a summer business and unfortunately for the
industry the summer months are the months when it is
hardest to keep milk in good condition for any length
of time. Merely keeping milk cold is not enough. We
must go back further and see that the milk that is to
be kept cold is clean. Cleanliness is to some extent
parallel with but even more important than the carrying
back of our standardization process to the raw material.
If all milk were clean and cool when manufactured
into dairy products there would be no need for standard-
izing raw materials because fresh milk cannot be altered
except by adulteration or condensing. It would be
unfortunate and a poor commentary on the intelligence
and honesty of farmers if it should ever be necessary
for us to have compulsory grading of milk for cheese
factories. This should not be necessary and after all
the best kind of grading is the kind that is done voluntar-
ily, by each dairyman doing his best to produce the
cleanest milk possible under his conditions. A great
deal of the trouble now is due to indifference and igno-
rance. Ignorance because we do not know sufficient
about the marketing end of our business so that we can
appreciate what poor milk means to the finished product
and eventually to our balance of trade with other
countries and the wiping out of our national debt. This
not at all far fetched because it is only common-sense to
think that the prosperity of the country is based primar-
ily on the intelligence and the thrift of the individual
whether he be farmer, employee or manufacturer. The
trouble due to indifference arises out of the fact that when
we milk the cows and strain the milk, or clean the stable
at milking time, we do not think in terms of cheese on

the table of some family
in Great Britain, who help
to swell our national trade
balance and provide us with
the market for our milk.
We are not indifferent to
the immediate price we re-
ceive for our milk, but we
are too indifferent to the
ultimate destiny of our pro-
duce. Our outlook must be
changed before we can ever
have voluntary grading of
our raw materials. And good
milk is absolutely essential
to a first-class product.

Clean milk means clean
healthy cows, clean stables,
clean utensils and clean
dairywomen. None of these
are beyond the reach of the
average cheese factory pat-
ron. To have clean, healthy
cows we must supply plenty
of ventilation and exercise
when they are stabled. The
cow is a wonderful machine
for the manufacture within
her body of human food and,
like any other machine,
her body must be taken care of.
No other single animal,
aside from the human being,
is so important on this
earth as the dairy cow. From
her body we secure
milk, cream, butter, cheese,
condensed, evaporated and
powdered milks, beside many
other important products
used in manufacturing and for
the feeding of other
kinds of live stock. Milk,
however, is very perishable,
in fact so perishable that in
the warm weather of summer
it is very difficult to keep
in satisfactory condition.
Thus it is that the cow her-
self must be kept clean and
healthy as a primary precau-
tion against unhealthful
and dirty milk. The feed and
water she consumes are just
as important as ventilation
and exercise, because it is
from these that the milk is
actually manufactured within
the cow's body. The cow will
need pure water especially for
the manufacture of clean milk,
because milk itself is over 80
per cent. water and a cow that
yields heavily needs all this
water besides that necessary
for the maintenance of her
body. Some feeds tend to taint
the milk no matter how they
are fed, while others, unless
fed very skilfully, will pro-
duce unsatisfactory results.
Brewers' grains, distillery
slops, turnips or tops, rape,
mouldy meal, spoiled hay,
spoiled silage or cleanings
from horse stables, are among
the feeds likely to produce
such results.

Dirty stables are the result
of pure carelessness or lack
of sufficient help. The latter
conditions is very hard to
overcome, but where both
conditions are met with the
effect on the milk is very
serious and may even be
injurious to the health of
those who drink or use it.
The importance that is
placed upon clean milk from
a health standpoint is realized
by all those supplying