2. To help the retailer expand his opera-
tion with greater returns on his invest-
ment and labor.

3. To help bring a greater choice of
foods to shoppers that they may improve
purchases for the nutritional needs of
their families.

Now, nearly a year after the start of
the project, the following has been ac-
complished:

1. Established demonstrations in three
markets. One a full service general store
in an isolated Spanish-American mountain
community; another a convenience operation
in a small community with recreational po-
tential and community access to larger
markets in a community only 12 miles away,
and lastly a trading post in the heart of
the Navajo nation, many miles from alter-
native sources of a complete grocery se-
lection.

2. An intensive personal interview survey
of 118 families in one of the demonstra-
tion areas.

3. Development of new floor plans for two
of the demonstration markets, based in
part on the above survey and studies of
traffic flow patterns and shifts in the
merchandising objectives of the business.

4. Consultation with management of the
demonstration markets on their management
practices.

Much additional work remains to be
done. Plans have been made to intensify
our work with the cooperating markets.
They will be utilized in seminar sessions
held for management of the many other re-
tail food markets of the northern part
of the state. Hopefully, educational ma-
terials will be developed, and an on-going
program of educational assistance for the
many small food retailers of the state
will be implemented.

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COMPARATIVE METHODS OF HANDLING PRODUCE
FROM WAREHOUSE SLOTS TO STORE HOLDING AREAS

by

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The study of alternative systems of handling produce from warehouse selection
to storage in the retail store showed that
the pallet system was the least expensive,
costing $103.75 per 1,000 cases delivered,
compared to $113.40 for mobile cart ship-
ment and $140.71 when produce is hand
stacked in the trailer, Table 1. The study
further showed that the availability of
backhaul revenue further reduced the cost
delivery. There was no backhaul for cart
shipments because the rigid cards used all
available space in the trailer. Collaps-
able carts will free approximately 75 per-
cent of trailer space for backhaul freight
but the potential revenue should be adjusted
for the added cost of the cart and the la-
bor to erect and collapse the cart.

Warehouse labor for selection was
$4.58 per 1,000 cases less for the pallet
system than the cart system. This was due
to the greater capacity of the pallet and
the lower time to select and position the
Table 1

Summary of total warehouse and retail store costs per 1,000 cases

<table>
<thead>
<tr>
<th>Item</th>
<th>System</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pallet</td>
<td>Hand Stack</td>
<td>Cart</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dollars</td>
<td>Dollars</td>
<td>Dollars</td>
<td></td>
</tr>
<tr>
<td>Warehouse labor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection</td>
<td>21.90</td>
<td>22.88</td>
<td>26.48</td>
<td></td>
</tr>
<tr>
<td>Restocking</td>
<td>3.30</td>
<td>3.30</td>
<td>3.30</td>
<td></td>
</tr>
<tr>
<td>Loading</td>
<td>2.77</td>
<td>11.65</td>
<td>4.75</td>
<td></td>
</tr>
<tr>
<td>Retail store receiving</td>
<td>18.88</td>
<td>37.80</td>
<td>10.80</td>
<td></td>
</tr>
<tr>
<td>Delivery</td>
<td>49.43</td>
<td>59.89</td>
<td>51.48</td>
<td></td>
</tr>
<tr>
<td>Equipment, dock ownership and structural alterations</td>
<td>7.47</td>
<td>5.19</td>
<td>16.59</td>
<td></td>
</tr>
<tr>
<td>Gross cost</td>
<td>103.75</td>
<td>140.71</td>
<td>113.40</td>
<td></td>
</tr>
<tr>
<td>Backhaul revenue</td>
<td>10.37</td>
<td>9.76</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Net cost</td>
<td>93.38</td>
<td>130.95</td>
<td>113.40</td>
<td></td>
</tr>
</tbody>
</table>

The loading of pallets on delivery trailers required $1.98 less labor per 1,000 cases with pallets than carts, and $8.88 less than hand stack. Pallets were the least expensive because: 1) the pallet had a larger capacity, therefore fewer trips into the trailers were necessary, 2) the selectors loaded the pallets, eliminating parking on the dock, and 3) less time was needed to remove empty pallets from the trailer. Hand stack was the most costly loading method because all cases were manually positioned in the trailer.

Retail labor costs for unloading full carts, moving them to storage and for loading empty carts back on the trailer were $8.08 per 1,000 cases less than for pallets. This is based on half of the stores having truck bed level docks, and half using trailer elevators for carts and hydraulic lift platforms or a walkie-stacker lift fork for pallets. The lowest cost receiving method was carts over a dock ($8.46 per 1,000 cases). Any potential advantage of hand stack delivery (notably large trailer loads) was cancelled by the high labor costs of unloading ($37.80 per 1,000 cases).

Delivery costs were approximately the same for all produce handling systems, with pallets having a slight advantage -- $49.43 per 1,000 cases, compared to $51.48 for carts. Delivery costs were affected by trailer capacity, time to load and unload, and backhaul revenue. The backhaul revenue of the pallet firms studied...
reduced delivery costs to $39.06 per 1,000 cases - $12.42 per 1,000 cases less than cart delivery costs.

The cost of equipment, dock ownership and structural alterations was $9.12 per 1,000 cases more for carts than the pallet system. This was due almost entirely to the cost of the mobile carts. The hand stack system was the least expensive ($5.19 per 1,000 cases) because little equipment and modification was needed at the store level.

Studies were made of two types of selection systems: the long selection line where all produce items were slotted and the selectors route covered all slotted areas, and the short selection route where produce was removed from storage and temporarily staged in a selection line near the shipping dock. The cost of restocking and selection was $12.40 per 1,000 cases higher for the short selection line. The higher cost of the short selection line was due to labor to set up the line and to return to storage the merchandise not selected.

The size of the produce order has an effect on selection productivity. In one firm which had store orders ranging from 5 to 200 cases, the labor cost of selection varied from $31.05 per 1,000 cases for orders of 10 cases or less, to $16.40 for orders with over 75 cases. The greater time for the smaller orders was due to the increased travel time, to and from the dock, and between case selections.

The question of whether to ship produce with the grocery order in a combination load or to serve several stores with a multistore (shuttle) run, does not occur for metropolitan stores or those far from the warehouse and isolated from other stores. The former should be shuttle runs and the latter combination loads. When out-of-town stores can be grouped to form logical delivery routes then the key factors are total mileage per week to serve the stores and the frequency of delivery for produce and grocery for each store. When stores were grouped in a triangular or a straight line route the combination load was the lowest cost system. Average savings were 15 percent. Costs were identical for supplying a group of stores in a satellite city. As the ratio of produce to grocery deliveries increases, produce shuttle runs become the lower cost system. The firm should make certain that any delivery savings resulting from combination loads not be at the expense of loss in produce quality when the trailer does not have proper temperature control for each commodity.

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