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FACTSHEET

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Hoop Shelters for Grower-Finisher Pig Housing

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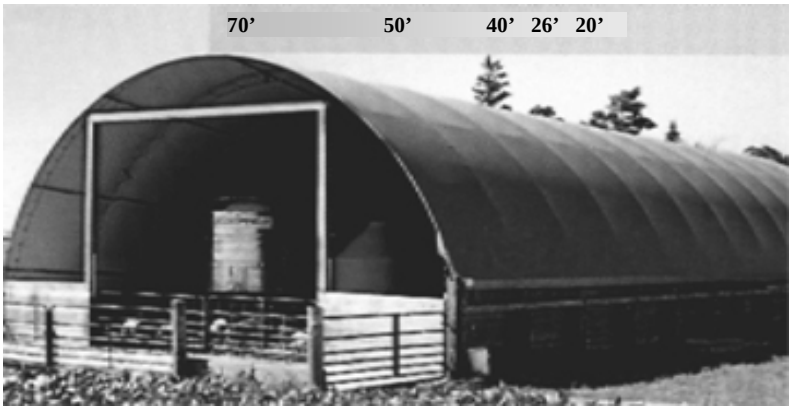

INTRODUCTION

The use of hoop shelters for housing growing and finishing pigs is becoming an attractive option. A producer can add housing space to his present operation with low capital investment. In addition, they can be used at the same or different sites for purposes other than for housing pigs. Their usefulness as a housing system to respond to environmental and welfare concerns also holds some potential. The manure together with the bedding material can either be composted or stored in a separate shelter, and subsequently applied to the land. Alternatively, the manure can be moved off-site, as is being done with chicken litter on some farms. In addition, these shelters are ideal for tail-enders, especially when space must be created for a new batch of growing pigs.

Most of the information on the use of these shelters was developed from trials in Manitoba and Ontario, and from on-farm experiences in Saskatchewan. Some B.C. producers on Vancouver Island, North Okanagan and the Fraser Valley are currently using these structures. Their experiences were used to enrich the information provided. Following are general guidelines, and each producer must evaluate which recommendations would work best for a given farm.

DESCRIPTION

These tarp-covered structures are called BioTech or Cover-all Shelters in Canada, Tunnel housing in Europe, and Hoops in the mid-western USA. Despite their different names, the building design is somewhat similar for all. The most commonly used size is one 30 feet by 70 feet long, capable of housing about 180 finishers. Some producers

have found that reducing the numbers of pigs to 160-170 results in better performance and required less bedding material. Shelters longer than 80 feet do not have a good air movement, especially in the center where dead air spaces may occur. A typical hoop consists of fibre woven polyethylene tarp drawn over arches which are made of galvanized steel tubes set on 8 inch posts or railway ties. The tarp is silver coated on the outside surface to reflect solar radiation. It is advisable to pay special attention to building orientation to allow maximum air flow during hot summer months. Arches are generally placed at six foot spacing. This distance may have to be decreased for high snow load locations. Purlins made from galvanized steel tubings run lengthwise between arches to add stability to the structure, and to provide additional support to the flexible covering. Post heights can be adjusted to obtain the desired interior height of the building. Heights must be adequate to prevent hot engine exhaust fumes from burning holes in the tarp. A concrete pad 12- 15 feet by width is generally used to place the feeder and waterers on. It is recommended that this pad be about 12 inches higher than the base of shelter floor.

BEDDING MATERIAL

Most hoop structures use bedding on earthen floors. The bedding material used in the Prairies is usually straw, but sawdust and wood shaving are more popular in B.C. It is advisable to check the source of your sawdust to ensure that it does not come from wood treated with preservative such as pentachlorophenol. The use of bedding material from soft woods such as pine and hemlock are preferable. For a bedding depth of approximately 12 inches, a 30 foot x 70 foot shelter would require a sawdust volume of about 2,000 cubic feet or about 55 cubic meters for each batch of pig. Place bedding materials about 8 inches, and add more material gradually to the required height of about 12 inches. In areas with heavy rainfall and poor drainage, it will be necessary to raise the level of the site on which the shelter is built. Water seepage from saturated soil onto bedding can result in a very messy situation.

FEED CONVERSION

Table 1. Average feed conversion ratios for fattening pigs from trials and on farm data collections at different geographical locations

Location	Hoop Shelters	Conventional Barns	Period	Difference
University of Manitoba Cotswold Pigs	2 .94	2.81	Over two years	0.13
Quality Swine Co-op Ontario	3 .39	3.25	Throughout the year	0.14
Midwest USA			Throughout the year	0.40
Q-2 Industries, Ltd. Saskatchewan	3 .36	3.76		0.40
Average				**~0.27**

Feed conversion ratio is defined as the amount of feed consumed per unit gain. For example, if a pig consumed 300 kg of feed, and put on 100 kg of body weight, its feed conversion ratio is 300 divided by 100 = 3.
Average feed conversion ratio can be about .3 units higher than feed conversion ratios in conventional barns. This can be seen in Table 1. These ratios are influenced by several factors such as breed of pig, time of year, age and weight when placed in shelter, ration formulation and degree of processing. The thermal comfort zone for growing and finishing pigs ranges between 15 degrees and 25 degrees Celsius. Addition of bedding can lower this range. Generally, pigs tend to eat more when the immediate surrounding temperatures approach or fall below the lower end of this range. B.C. winter temperatures on the South Coast and in the Interior are milder, and their durations are shorter than those on the Prairies. Consequently, one would expect feed conversion in shelters in B.C. to be lower than those obtained in similar housing in Saskatchewan, Manitoba and Ontario. It should be noted that feed conversion is similar to conventional barns in spring, summer and early autumn. Trials are required to determine feed conversion under B.C. environmental conditions.

PIG HEALTH

Pig health and mortality rates in these shelters are comparable to confinement facility. Research results from University of Manitoba indicated no chronic stress from hogs raised on straw throughout the different seasons. Feeder hogs raised on sawdust or straw appear to enjoy the freedom to wander in large open areas. It is not clear whether deep bedded systems on a dirt floor may encourage internal parasites. Parasites were not a problem in Manitoba studies when the pigs going into the shelters were free of parasite, and all-in all-out was practiced. In general, pig health is good if managed on an all-in all-out basis.

MEAT QUALITY

Carcass characteristics for fattening pigs were similar in both of the shelter and conventional barn in two studies done in Canada. Future trials are needed to evaluate carcass characteristics under growing conditions in BC.

TEMPERATURE CONSIDERATIONS

The temperatures in the bedding are generally higher than those in the immediate surrounding air of shelters. Heat is generated from pigs as well as from the manure that is undergoing composting. Animals' abilities to cope with cold stress are enhanced at larger body weights. Consequently, attention should be paid to cold drafts in winter when pigs from nurseries are moved into shelters, and there is no composting happening in the bedding material. University of Manitoba studies showed that overall growth rates were not affected even when air temperatures were often only 10 degrees Celsius warmer than the -20 degrees Celsius to -40 degrees Celsius outside temperatures. Winter temperatures in B.C. are milder than those of the Prairies and Ontario, and therefore one would not expect a reduction in growth rate for pigs raised under these shelters provided all conditions for growth are met.

Pigs are generally clean animals, and if provided with a suitable environment, will excrete in that part of the pen not intended for sleeping or resting. High summer and cold winter temperatures descending on hogs can change this dunging pattern. Adequate ventilation should be maintained, while at the same time preventing drafts

during the cold months of the year. During the summer, both ends of the shelter can be opened to encourage good cross-ventilation. However, when summer temperatures are unusually high, other ways to reduce temperatures in these shelters need to be developed.

MANAGEMENT AND HANDLING CONSIDERATIONS

This housing system is different from conventional barns. Consequently, the way pigs are managed and handled is different. Producers must walk through the bedded area to look for sick and injured pigs twice daily. Shelters can not be operated as continuous flow units, and so it is necessary to manage pigs on an all-in all-out basis. In addition, the ground must be well bedded before young pigs are moved into shelters, especially during the winter. Bedding should be added regularly up to about 1 foot to maintain a dry environment. Frost-free waterers are necessary, and light to observe animals after dark is recommended.

Raising pigs in large shelters may result in more competition than in conventional barns. This may lead to wide variations in live weights when the first set of hogs are ready for market. It may take more time to grow the lighter pigs to market, and consequently more time to empty the shelters. This should be taken into consideration when planning for marketing etc.

Sorting and weighing of pigs can be carried out with the aid of some temporary penning panels and posts. A Saskatchewan report indicates that two stock persons can sort and weight 180 pigs in 30-40 minutes. However, an Ontario report suggests twice that length of time for the same number of people sorting and weighing 150 pigs. The time to sort and weigh pigs depends on the layout of the sorting system. Generally, light pigs are sent to the area around the feeders. Heavy pigs are moved onto a scale located on the concrete pad, then for tattooing and loading.

COST CONSIDERATIONS

The estimated cost to set up a hoop shelter measuring 30 feet by 70 feet is about $10,000. This translates to about $60 to $70 per finisher pig place. This is far less than the typical cost of conventional barns ($250-$300 per finisher pig place). The studies in Manitoba and Ontario, as well as reports from the mid-western States indicate that return per pig is comparable and slightly greater for pigs raised in hoop shelters. The decision to use these shelters should be guided by a business plan that would consider costs and benefits specific to your operation.

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