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Various methods of cooling sows in outside lots

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Abstract

Intermittent sprinkling in outside individual sow pens reduces the amount of water used to cool the sow without adversely affecting performance.; Swine Day, Manhattan, KS, November 13, 1980

Keywords

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Various Methods of Cooling Sows in Outside Lots

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Summary

Intermittent sprinkling in outside individual sow pens reduces the amount of water used to cool the sow without adversely affecting performance.

Introduction

All livestock exposed to heat stress will attempt to maintain body temperature. They may lose heat by both nonevaporative and evaporative avenues, but as heat stress increases, loss by nonevaporative means decreases. Consequently, evaporative heat loss must increase to maintain the animals' well being. For swine exposed to heat, evaporation is made more difficult because the pig cannot sweat. To increase evaporative heat loss, water for evaporation is typically supplied by fogger, sprinkler, wallows, or other means. Cooling by evaporation requires drying. To maximize the effectiveness of evaporative cooling, the pig should be wetted quickly then given time to dry. Low volume constant wetting (foggers) do not provide time for drying. So, timed sprinklers (high volume wetting followed by drying) are more appropriate for evaporative cooling of livestock.

Experimental Procedure

Sows with litters housed in individual swine houses with snow fence shade were used to compare various systems of wetting: Continuous fogging (1.9 gal/hr) and sprinkling (9.5 gal/hr) were compared with intermittent sprinkling (2 min sprinkling then 13 min drying). A timer and solenoid valve (Figure 4) provided the intermittent sprinkling with about 1.3 gal/hr. Fogging and sprinkling operated when ambient temperature exceeded 80 F.

Results and Discussion

Sows cooled with the intermittent sprinklers had the highest pig survival rate, 86.3%, compared with the continuous cooling methods having 80.7, 77.6 and 74.8%, respectively, for fogger, tip sprinkler, and angle sprinkler (Table 16).

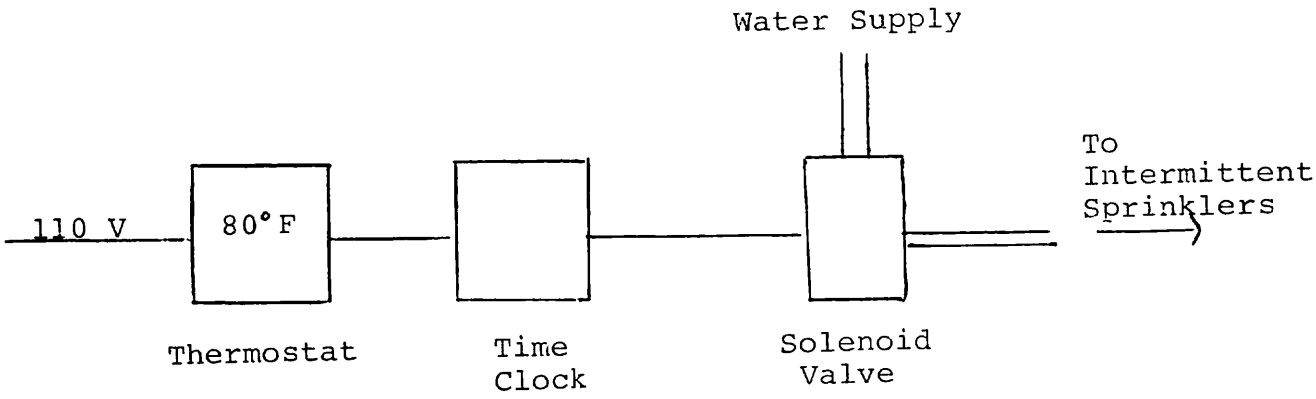
Intermittent sprinkled sows tended to have fewer incidence of sunburned udders, which may partially explain the slight increase in survival rate over the continuous cooling methods. After the two-minute sprinkling period, the sows would normally move into individual huts for shade, while those with continuous wetting systems would lie under the foggers or sprinklers, udders exposed to the sun.

Table 16. Results of Various Cooling Methods on Sow Performance - Cooperative Trial with Darrell Goss, Garden City[a]

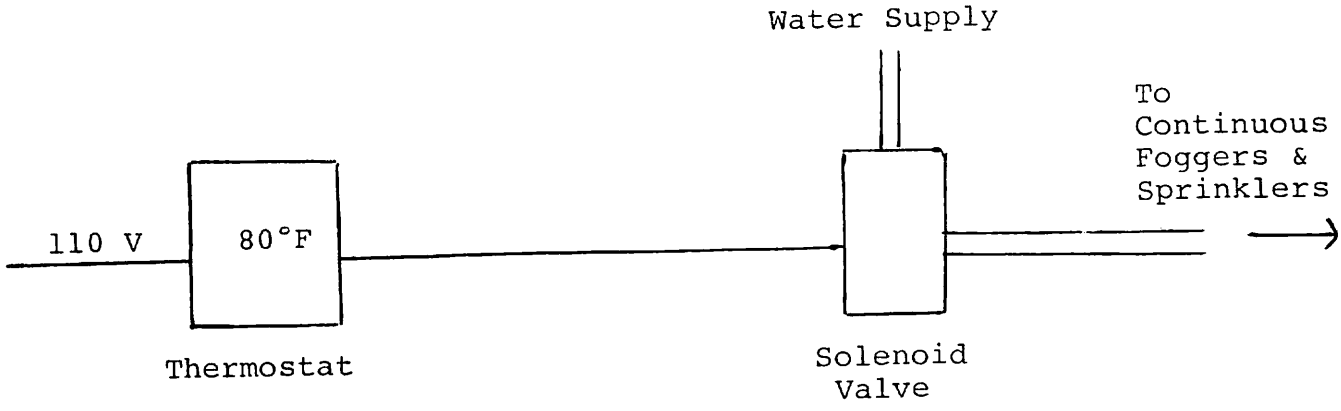
Item	Continuous			Intermittent
	Fogger	Tip Sprinkler	Angle Sprinkler	Sprinkler
Water volume, gal/hr	1.8	9.5	9.5	1.3
No. sows	12	11	30	11
Avg. no born	10.33	9.73	10.30	9.90
Avg. no. 21-days	8.33	7.55	7.70	8.55
Survival %	80.7	77.6	74.8	86.3
Avg. litter wt[b], lbs	91.3	80.0	86.0	88.3
Avg. pig wt[b], lbs	11.0	10.6	11.2	10.3

[a]Conducted July to September, 1980.

[b]Adjusted to 21-day weight.



INTERMITTENT SYSTEM



CONTINUOUS SYSTEM

Figure 4. Control systems for sprinklers and foggers