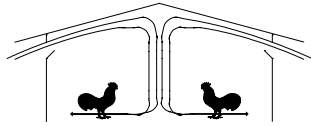




The University of Georgia

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Poultry Housing Tips

Cable Life and Pulley Size

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Do you have a problem with inlet and curtain cables breaking? If so, you may be interested in learning that most cable breaks are due not to insufficient cable strength, but to improperly matching of cables to pulleys.

Pulleys are an essential component of any piece of equipment that uses cables. They enable a grower to change the direction of, or turn a cable. In the process of changing the direction of the cable the pulley is also bending that cable. The bending of a cable may not seem like much of a problem until you realize how many times a day various sections of a cable go around pulleys. A curtain machine may adjust the curtain opening a hundred times a day. An inlet machine may open and close the inlets over two hundred times a day. In either case, various sections of the cable are being bent thousands of times each month.

Bending a cable places a strain on the cable and that can lead to breakage. Think about it; you have probably broken a piece of wire intentionally by bending it back and forth. Though a cable is more flexible than an individual strand of wire, bending still causes wear and tear.

How much a pulley affects cable life is largely dependent upon the size of the pulley. The larger the pulley, the less likely a cable is to break. This is because the larger the pulley, the less the cable is bent. In fact, studies conducted by cable manufacturers have found that by doubling the pulley diameter, cable life can be increased by up to thirteen times.

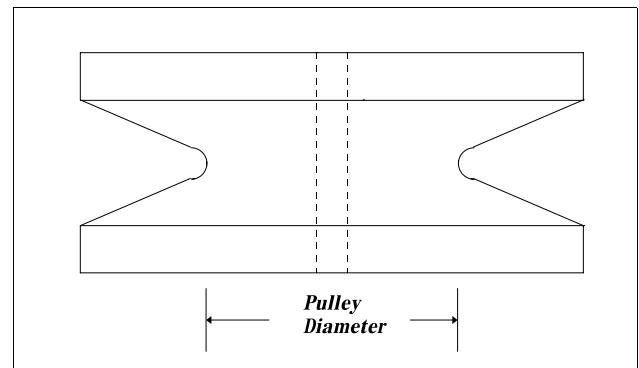


Figure 1. Pulley Diameter

A second benefit for using larger pulleys is that the larger the pulley, the less likely the cable will slide over the pulley. Cable manufacturers have found that many cable breaks are caused by the cable not having enough contact surface with the pulley. If the cable and pulley are under a load, there is a high likelihood that instead of the pulley turning the cable will just slide over the surface of the pulley. This of course leads to the wearing down of the cable and eventually breakage.

The type and size of cable determines exactly how large the pulley needs to be to minimize wear. The more flexible a cable, the less likely the cable will break. There are primarily two types of steel strand cables used in poultry

houses: 7 X 7 and 7 X 19. A 7 X 7 cable consists of seven large bundles of wire, with seven wires per bundle. A 7 X 19 cable consists of seven large bundles of wire, with 19 wires per bundle. In general, 7 X 19 cables are more flexible than 7 X 7 and, as a result, do not need as large a pulley as 7 X 7 cables. Furthermore, the smaller the cable, the smaller the pulley required.

Steel strand cable manufacturers publish minimum recommended pulley diameters for different sizes and types of cables. For instance, a 7 X 7 cable should have a pulley diameter that is a minimum of 42 times the diameter of the cable. A pulley for a 7 X 19 cable should have a diameter at least 25 times the cable diameter. The chart on the following page shows the minimum recommended pulley diameter for various types and sizes of cables. By following these recommendations, cable wear (and therefore breakage) can be kept to a minimum.

Even with the proper pulley size, cables will not last very long if the pulley is not properly aligned with the cable. The cable needs to be fed directly into the groove on the pulley. If not, the cable will wear against the side of the pulley, dramatically reducing the life of the cable. To further reduce cable wear, the pulley should have a smooth interior surface as well as bearings to minimize cable slippage over the pulley.

Studies presently are being conducted by University engineers and poultry scientists to find ways to minimize cable breakage. These studies include the use of nylon coated cables, internally lubricated cables, four inch pulleys with bearings, large pulleys (6" diameter) with and without bearings, and the use of steel rod instead of cables. The results of these studies will be covered in future newsletters.

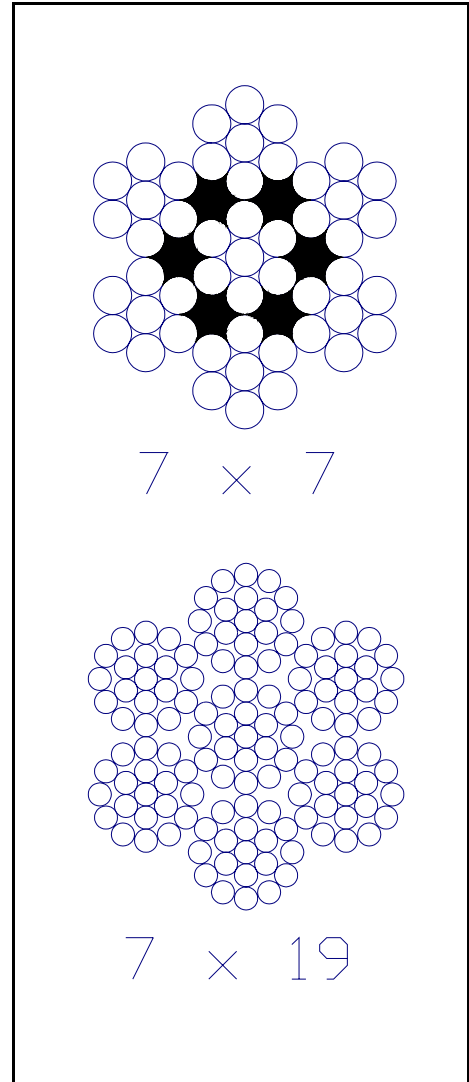


Figure 2. Types of Cables

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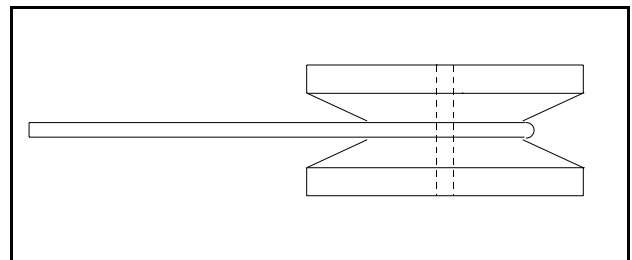


Figure 3. Proper Pulley and Cable Alignment

Minimum Pulley Diameter for Various Cable Types and Sizes

Cable Diameter	Minimum Pulley Diameter (inside diameter)	
	7 X 7	7 X 19
1/16"	2 5/8"	-
3/32"	4"	-
1/8"	5 1/4"	3 1/8"
5/32"	6 5/8"	3 7/8"
3/16"	7 7/8"	4 3/4"
7/32"	9 1/4"	5 1/2"
1/4"	-	6 1/4"
5/16"	-	7 7/8"
3/8"	-	9 3/8"