

Protect Your Hearing¹

Prepared by Jill Shelley and Michael Dennis²

"You don't notice a thing until you don't notice a thing," is how Kansas farmer David Briggs describes his hearing loss. Briggs, who is in his early 60s, is among those farmers 50 and older who have greater hearing loss than other people the same age in other occupations. Researchers also have found that perhaps as many as a quarter of farmers have a communication handicap by age 30. Studies of high school and college students from farming communities have found that a significant percentage have less auditory sensitivity than their peers.

Farms are very noisy places and noise literally wears out the ears. Sound travels as pulsating waves of air pressure. Those waves strike the ear drum and their vibrations travel through the bones of the middle ear to the inner ear, or cochlea. In the cochlea, approximately 30,000 hairlike protrusions signal the auditory nerves to the brain. These hairs can recover from infrequent, brief exposures to intense noise but if they're continually subjected to it, they break down and no longer respond to sound. The nerve fibers connected to the hair cells also degenerate, leaving the central nervous system less able to adapt to sound. The damage is cumulative and irreversible, although modern hearing aids can significantly improve hearing.

Ears provide two warning signals that noise is too loud: temporary threshold deafness and ringing in the ears (tinnitus). A relatively short exposure to loud sound may bring temporary deafness. The first symptom of a permanent hearing loss usually is an inability to hear high pitched sounds that are particularly important in understanding speech. (It may very well be true that some older male farmers really don't hear their wives.)

Speech and other sounds seem muffled. As hearing loss progresses, musical tones lose their distinctness. Eventually, the ability to hear normal speech is impaired.

Exposure to hog squeals can lead to hearing loss. Pig squeals register approximately 105 decibels. Health officials recommend spending no more than four hours per day in areas with this sound level. However, safety specialist say wearing protective ear plugs or headsets around hogs will help reduce the impact of the decibel level making it possible to work for longer periods than four hours. See Table 1.

Deafness from constant exposure to loud noise isn't just an inconvenience. Sounds warn of impending trouble and are important for many safety related reasons. Being bombarded by noise can lead to fatigue, which can lead to preventable accidents.

Hearing experts say excessive noise can cause other health problems. Over time, constant exposure to noise increases blood pressure, cardiovascular disease, and ulcers.

Even though noise-induced hearing loss in farming was first documented in the late 1930s, only 20 to 30-percent of farmers report using hearing protection and many of them admit they rarely use it.

"That's hard for me to understand now," Briggs says, "because once you get used to them you hear everything you did before only it's not hurting you."

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Table 1. Sound ratings and danger zones of common farm noises.

Noise level (Decibel)	Common Sounds
Safe Zone	
0	Lowest audible sound
50	Empty barn, babbling trout stream, gentle breeze
60	Normal conversation
70	Chicken coop, farrowing area
Risk Zone	
85	Tractor or combine idling, barn cleaner, conveyor, elevator (At this decibel level noise may begin to affect your hearing if you are exposed to it for more than 8 hours per day.)
90	Blower compressor, pneumatic wrench, chopping silage (no cab), full throttle lawn mower. (As noise gets louder, the "safe" time decreases: damage can occur if you're exposed to it for more than 4 hours per day.)
100	Tractor at 80% load, squealing sows, power tools, hand-held metal grinder (1 hour of exposure per day at this decibel level is the limit before damage occurs.)
110	Average walkman set above the halfway mark, full-throttle combine, 10-HP vane axial barn fan: Anything over 15 minutes of exposure per day can cause damage.
Even more dangerous...	
120	Thunderclap (near), sandblasting, bad muffler, old chain saw: The danger is immediate.
140	Gunshot, engine backfire, dynamite blast, jet engine: Any length of exposure time is dangerous; and may actually cause ear pain.

For some people whose hearing is already damaged, ear plugs or muffs do slightly reduce the ability to understand normal speech. However, all noise is reduced, so sounds still can be compared to one another. According to Briggs, "I've heard folks say they won't wear ear protection because they need to hear the tractor noise. Well, I hear it every bit as well now, and I'm still using the same old tractor."

HEARING PROTECTION

Hearing protectors can lower sound levels by 15–30 decibels if there is a complete seal between the hearing protector and the skin. The two basic types are ear plugs and ear muffs. Both are lightweight and comfortable, and both have advantages and disadvantages.

Ear plugs usually are made of plastic or rubber and are inexpensive. They should be fitted by a physician to get the airtight seal necessary to totally block the ear canal; some people need a different size for each ear. Jaw movement may loosen them, so they should be re-sealed occasionally. They must be kept clean to prevent ear infection.

Temporary or disposable inserts such as those made of wax, fibrous glass wool, or framed plastic are effective if they are fitted well. Ordinary cotton balls stuffed into the ears reduce noise by only about seven decibels. Kansas State University speech and hearing specialist, Dr. Harry Rainbolt, recommends cotton never be used to reduce noise exposure. "Cotton cannot block out high frequency sound and will provide no protection from high sound levels."

Ear muffs are somewhat more effective than ear plugs. However, even a slight opening between the muff and the head may reduce the effectiveness of the ear muffs. Special foam pads are available to slip on the temple pieces of eyeglasses and keep the muffs fitting tightly. Some of the plastic pieces next to the head may lose their elasticity if they're repeatedly drenched with perspiration.

Other alternatives probably will not be as effective. Radio headsets do not give adequate protection. They may eliminate some of the higher frequency sounds, but they are of little or no value in the low frequency range, the range of most tractor noise. The earplugs worn by swimmers do not protect hearing. Hearing your own voice louder and deeper is a sign that the hearing protectors are positioned properly. General guidelines:

1. Doubling the distance between the source of the sound and the listener reduces the sound level heard to one-fourth of what it was at the listener's original position.
2. Any time you must shout to be heard 3 feet away the noise level is high enough to cause damage.