

HEARING LOSS

Teacher Fact Sheet

Farmers are exposed to many sources of noise, often continuing for long periods of time at levels that are potentially damaging to hearing. A number of studies have suggested that farmers have higher than expected rates of hearing loss. The farm population suffers an increased risk of hearing loss, largely due to occupational noise exposure (Broste, et al., 1989). This exposure to high frequency noise levels can start at a young age, and the negative results may be compounded when the person's exposure accumulates over time.

- **Damage** to the ear due to noise exposure is cumulative and irreversible. It is similar to a tooth cavity – once it is there it never goes away – it only gets bigger.
- Loud noises adversely affect hearing by damaging tiny “hair cells” located in the cochlea of the inner ear. Repeated exposure to loud noises causes the “hair cells” to lose some of their resilience. When this occurs the “hair cells” no longer function properly.
- Sound energy is measured in decibels (dB). The decibel scale is not linear. An increase of six decibels equals a doubling of noise produced. This means that a noise level of 96 decibels is twice as harmful as a noise level of 90 decibels (Maine Department of Labor, 1998).
- Thresholds of pain occur above 140 decibels. Noises at 90 decibels and above are considered to put individuals at risk of hearing loss. Items that are at levels at 60 decibels and above are at the level of annoyance threshold. Exposure to high noise levels may cause fatigue, elevated blood pressure, tension and nervousness, and hearing loss. Hearing damage can begin at sound levels as low as 85 to 90 decibels, and many farm machines are louder. Refer to the sound levels thermometer in the student section.
- Hearing is an essential part of your ability to communicate with others. With a hearing loss you have difficulty understanding your surroundings. Examples might include:
 - not being able to hear the auctioneer at the sale barn
 - not being able to negotiate with the seed dealer on the phone
 - not being able to communicate with your customers
 - not being able to hear your child or spouse say, “I Love You”
- **Protection:** Hearing loss can be prevented by a combination of increasing the distance between the person and the noise source, decreasing the exposure time to the noise source, and using personal protective equipment.

- Wearing protective earmuffs or earplugs when around noise levels of 90 decibels or higher is recommended. Earmuffs that keep ears warm in the winter should not be confused with those that protect the ears from high noise levels.
- In selecting hearing protection look for the Noise Reduction Ratings (NRR) label on the device. The NRR number is an estimate of the protection provided. Be sure the rating is high enough to reduce sound pressure to acceptable levels. Example: A device marked “NRR 26” is intended to reduce a 100 decibel noise to $(100 - 26) = 74$ decibels under ideal conditions. In actual use, it may provide only about 50 percent of that protection, or 13 decibel, resulting in $(100 - 13) = 87$ decibel sound level (Deere & Company Service Publications, 1994).
- Earplugs are available to help protect damage from high noise levels. Rubber or plastic earplugs fit into the ear canal and are effective noise suppressors. A snug fit is important, so have them custom-fit for comfort and protection. Cotton plugs do not block high frequency sounds.
- Protective earmuffs cover the sound-conducting bones around the ears as well as the ears themselves. They are comfortable, and they keep ears warm. Using earplugs and earmuffs together will not protect your ears much better than using just one type of protection (you cannot add the two).
- Remember that protecting your hearing should include protection from all noisy sources, not just farm sources. Construction and wood working machinery produces high frequency and high decibel levels. So do motors. If you notice that others can hear things when you cannot, you need to have your hearing tested.

NOTE: This lesson covers only noise-induced hearing loss, the type that affects higher frequencies first. There are other types of hearing loss and hearing damage. You may wish to consult with your school’s health or science teacher or school nurse.