



Towering mountains of packed silage, many with ragged faces, are common sights on Western dairies. They are also avalanches waiting to happen. Packed corn silage typically weighs between 40 and 48 pounds per cubic foot, so even a tiny break-off of just two cubic yards weighs more than a ton – which is plenty to do serious harm to anyone hit by it.



Silage bunkers and piles can kill

Face break-offs pose a constant and very real threat of injury or death.

by Hoard's Dairyman staff

Go ahead and smirk at how animated Keith Bolsen is during his presentation, but don't think for an instant that his passion for silage pile safety isn't deadly serious.

Instant and deadly . . . those two words come up often during his chillingly too-close-to-home discussion about the subject. Instant as in that's how long it takes for part of a silage feedout face to silently break off and fall, and deadly as in what the result can be for anyone located beneath it.

Sadly, it's a result that has happened many times already.

If Bolsen and his wife Ruthie had their way, safety would be the highest priority in every silage program – no exceptions. Theirs is a blunt and powerful message they want every dairy owner to hear: silage bunkers and piles can kill.

Bolsen recently took this warning to producers in Arizona, where he was opening speaker during the 2011 Southwest Nutrition & Management Conference in Tempe. While he stressed that silage bunkers and piles are dangerous everywhere, dairy producers in the West may be at even more risk because they have bigger herds, store more feed, and sometimes have gigantic silage piles.

One of the first comments he made told the audience that this presentation wasn't going to be just another

silage talk about TMRs or ration balancing: "We might just be able to save a life today."

Bolsen knows silage. He's a professor emeritus of Cattle Nutrition who spent 32 years at Kansas State University and now operates a silage management consulting firm in Texas with his wife. Over the years they have documented numerous bunker and pile accidents that have killed or injured farmers, family members, or employees – accidents he emphasized did not have to happen.

Common sense and stupidity

"Save a life today" was just the start of Bolsen's unabashed sermon about preventing bunker and pile accidents and saving lives, and it did not let up. His opening slide stressed that the two biggest problems in bunker and pile management today are safety and shrink loss. It was an unexpected and seemingly unrelated combination that attracted even more of the audience's attention.

His data about economic losses caused by shrink were eye-opening, but his collection of silage bunker and pile accident articles, headlines and personal correspondence, plus photos illustrating the danger that bunkers and piles present, were frightening. It's hard to imagine that anyone went home from the conference and looked at their own silage

piles without much greater respect and caution for them.

Preventing accidents, he said, starts with common sense. That they happen anyway is usually the result of stupidity. The photos above were just four of the many examples he used for show and tell.

Bolsen said one of the most common reasons for bunker and pile accidents is size; many are either over-filled or are just too big to be safe. Higher crop yields and/or growing herd sizes that require more acres to be farmed mean more silage needs to be stored. But unless new bunkers and piles are added or the footprint of existing storage is enlarged, there is nowhere for silage to go but up. As it does, so does the risk of a silage

pile accident.

Common sense says that a bunker or pile with a feedout face that is 8 or 10 feet tall isn't nearly as dangerous as one that is 20 or 25 feet tall. Such heights are not at all unusual on large dairies. That people walk up to them, poke at them, loiter, or stand near the edge on top of them is stupid, he said.

Packed doesn't mean safe

Respecting the risk posed by silage bunkers and piles makes perfect sense when one understands just a little of the physics involved in them.

Silage looks light and even a bit fluffy when it comes out of a feed truck and cows are eating it, but it's something much different in a stored pile. Even silage faces that are meticulously surfaced and appear to be very dense are not to be trusted. Bunkers and piles that have ragged, irregular feedout faces demand even more caution.

Face fall-offs are totally unpredictable, have many causes, and can't possibly be prevented – but people being under them can be.

Feed is heavier than it looks. Bolsen warned that packed corn silage typically weighs 40 to 48 pounds per cubic foot, which means just one cubic yard weighs over half a ton. That may not be a big deal if it sloughs off a pile face at waist height and buries



Keith Bolsen

your shoes, but what if it breaks off 20 or 25 feet up? What if it's 10 cubic yards instead of one? In reality, many of the accidents the Bolsens have documented involved more than 20 cubic yards.

The recent catastrophic tsunami in Japan reminded the world that something harmless in small volumes can have devastating power in big waves. Likewise, snow is light and fluffy in small amounts but can be hugely destructive when mountains of it move. Silage should be respected just the same way water and snow are, because avalanches of it can be just as deadly.

A silage mass that breaks off the top of a high bunker or pile feedout face has gigantic force. Its speed will be approaching 20 miles per hour when it hits the ground and the fall time will be less than a second. Have you ever been hit by a cow? Remember how you were brushed aside like you weren't even there? You probably don't want it to happen again.

Holsteins weigh around 1,500 pounds and even in a sprint they don't come close to 20 miles per hour. Now try to imagine getting hit by a mass of falling silage that weighs many times more. Consider this mental picture: A freight train and a car stopped on the tracks. You really don't stand much of a chance.

Advice for big dairies

Big dairies require a lot more feed and the danger of bunker and pile accidents needs to be taken more seriously because there is more traffic, there are more employees to keep track of, and feeding happens several times per day, maybe even when it is dark. As a result, Bolsen said it is an absolute must that dairies adopt a mandatory "buddy rule" that no one ever works at a silage pile feedout face alone.

However, his most basic safety recommendation is don't overfill bunkers and make piles smaller. He said bunkers and piles should be no taller than a skid-steer or loader bucket can reach. Yes that means more bunkers and piles. Yes it takes more space. Yes it's a hassle.

But smaller bunkers and piles also mean smaller and less dangerous silage avalanches. They're easier to cover and create a tight seal, they're easier and safer to uncover, and they feed out faster and more safely. Bolsen pointed out that all of these inconveniences improve silage quality and reduce shrink losses.

His final recommendation is also a very emphatic one.

"I get asked all the time, 'Should we pitch the spoiled silage layer at the top of a bunker or pile, or feed it?' My answer is always feed it, because removing it is too dangerous on many big dairies today," said Bolsen. "And I don't want to hear anyone say 'but . . . ' anymore. It's simply too dangerous to try to pitch even a small amount of spoilage from an overfilled bunker or a huge pile."

Bolsen ended his presentation by pointing out that he and Ruthie had just one take home message:

"The number one priority of silage

management is safety. It's not about shrink loss, feed conversion rate, cost of gain, or milk over feed cost. It's about sending everyone in your silage program home to their families every day."