

# DUST

by KAREN BURBACH

# ADVISORY

Every day, farmers are surrounded by dust that can leave them gasping for air.

Her light brown ringlets bounced as she carried knee-high buckets of milk across the family farm.

The petite tomboy spent hours in her father's shadow, her pint-sized legs racing to keep pace with her dad. As she grew, it was her father, though, who struggled to catch his breath as he walked to the barn and sat watching his only daughter inherit more of the farm chores.

Hog and grain dust, coupled with years of smoking, had damaged Herman Von Essen's lungs, often leaving him breathless as he fed hogs, picked ear corn and worked in the corncrib on the Pender, Neb., farm.

Susanna Von Essen, M.D., was too young to understand her father's gasps for air, but loved the outdoor work, whether it was chopping ice out of the cattle tank, feeding hay to cattle or pumping water for chickens. Only years later, did she fully understand the

mechanism behind chronic lung diseases, including chronic obstructive pulmonary disease, which killed her 72-year-old dad when she was 21.

Today, the northeast Nebraska farmer's daughter is a physician, academician and researcher whose rural roots keep her focused on helping others with pulmonary disease breathe easier.

"It's unfair when people can't enjoy their retirement years because they have chronic lung disease," Dr. Von Essen said. "It's worth it if I can prevent even one case of lung disease. Once you sustain a certain amount of damage, you can't do anything about it."

Professor of pulmonary medicine at UNMC, Dr. Von Essen has spent years studying rural health issues, including respiratory health and how exposure to organic dust – from hogs, cattle and grain – impacts farmers and veterinarians.



RURAL ROOTS AND MEMORIES OF HER FATHER KEEP DR. VON ESSEN COMING BACK TO THE FARM.

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She recently was chosen to lead UNMC's Rural Research Initiative, an effort to further strengthen the medical center's research in rural Nebraska. The role matches the dream career she once outlined in a college paper. "I always knew I wanted to live in the country or do something connected to rural life," Dr. Von Essen said. "It's all come together."

Each September, Dr. Von Essen provides free lung disease screenings to farmers at Husker Harvest Days, a giant farm expo in a cornfield near Grand Island, Neb. Using spirometers, Dr. Von Essen tests the lung

function of farmers and distributes free respirator masks to minimize exposure to potentially hazardous materials.

Dr. Von Essen's team has studied many different lung problems since she first volunteered in 1992. "Some people didn't know they had a problem or the extent of their problem. They just knew they had shortness of breath walking to the mailbox or while doing their work. We do a lung function test and find out they definitely have abnormalities for which they need to get medical attention."

Sometimes they find a rare lung disorder, like Farmer's Lung, she said. "It's usually in people who are exposed to a lot of moldy materials or otherwise hay or grain that's spoiled."

Because of her rural background and passion for medicine, Dr. Von Essen is the best advocate for rural Nebraskans, said Thomas Rosenquist, Ph.D., vice chancellor for research at UNMC.

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"The excellent corps of health scientists at UNMC gives us a unique opportunity to advance the health of rural Nebraskans," Dr. Rosenquist said. "Expanding research in rural health is a key part of our strategic plan."

Although the farm girl considered studying agriculture at the University of Nebraska-Lincoln, she loved biology and dreamed of being a physician. Upon graduation, Dr. Von Essen delayed medical school to accept a Fulbright scholarship at Albert-Ludwigs Universitat in Freiburg, Germany, where she studied parasitology.

Ag health research was gaining momentum when she earned her medical degree from Washington University in St. Louis. From there, she followed a suggestion by UNMC's Mike Sorrell, M.D., to explore pulmonary medicine and became the first fellow in pulmonary at UNMC. "My dad's health history, no doubt, played a role in my career," she said.

Today, Dr. Von Essen studies gene-environment interactions, which try to describe how genetic and environmental factors jointly influence the risk of developing a human disease. "Heavy dust exposure over

time increases the likelihood of chronic bronchitis from dust. But, I've always wondered 'Why do some farmers have breathing problems when they're around grain and hog dust and others don't? Is there a relationship to tobacco smoking and dust on the farm?'"

Dr. Von Essen, who initially studied inflammatory reactions from dust, knows certain kinds of dust can be

more irritating than others. She also knows that grain dust or hog dust may contain toxins that trigger adult asthma and asthma-related symptoms. But studies of endotoxin – a substance found in

some of the bacteria in dust – didn't explain all the pulmonary effects Dr. Von Essen found. "We're getting closer to understanding what else in grain dust can be contributing to what people are experiencing, including the cough, wheezing and shortness of breath," she said.

She's also interested in how the body adapts to a dusty environment. "There's often a severe initial reaction and then the body adapts, which creates a false sense of security," she said. "There's still a lot we don't know about adaptation."

To breathe easier, Dr. Von Essen advises agricultural workers to play it safe. "Anytime you're exposed to so much dust you can see it in the air you should wear a mask," she said.

As she builds research collaborations with colleagues around the country, Dr. Von Essen continues to be inspired by her patients. "I try to learn from all my patients, especially if they're farmers," she says.

"There's not many times in life that you have a major breakthrough, but every once and a while you help science advance and make a difference and that's what it's all about." 📖