

BY DESIGN

An ag engineer's toolbox

by Erin Cortus, University of Minnesota



After investing time and money to create a comfortable environment for cattle, there are

tools to check on your investment! As an agricultural engineer, these are a few of my favorite tools to check the environment in livestock facilities. Some may be things you already have in your toolbox. Others may be a worthwhile investment.

Keep in mind — these are tools. They are only effective when used properly, for the correct situation and if you know what to look for. The generic names for the tools are provided and are effective search terms to find purchasing options.

Handheld weather meter. This handheld meter measures temperature, relative humidity and air speed, among other things. I carry one around when I am in a barn to spot-check the temperature in the animal area, check the air speed through an opening, or verify a thermostat probe setting, for example. When taking a measurement, hold the meter at arm's length in the zone you want to measure. The temperature and humidity measurements by the meter may take a few minutes to stabilize. Place the wind sensor (often a vane) perpendicular to the wind for the highest measurement. Air speed can be variable; many weather meters have averaging or maximum features to help you interpret the readings.

Infrared thermometer gun. This type of thermometer works great for surfaces. I use this type of



Using a handheld weather meter to check the air speed over the cattle.

PHOTOS BY S. NIRAULA

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sensor to look for insulation differences (cold spots) on ceilings, roofs and/or walls, check floor temperatures in pens, and occasionally measure surface temperatures of the cattle. You simply point the infrared laser at the point of interest, squeeze the trigger, and let the temperature reading stabilize. One challenge is the limited area for any one measurement — multiple measurements may be required to create a full picture for an area.

Smoke sticks for ventilation. Smoke sticks produce a thin stream of smoke. These are most useful to identify drafts or leaks in a building shell, or to track air flow direction. They are less effective in broad openings or with high air speeds.

Some smoke sticks come in the form of a glass tube that you open to release the smoke; others are liquid-based. Be sure to follow the directions of any product.

Notepad. The cattle, weather and the resulting animal environment are constantly changing and will affect measurements by any of the aforementioned tools. A single set of measurements may identify an immediate issue. A longer-term record of environmental conditions has value as part of your overall production records, and supplements



A handheld weather meter is held beside a thermostat probe to make sure the probe is accurate.

continuous monitoring of cattle health and welfare. |

**TOOLS TO
ENVIRONMENT CHECKERS
SUCCEED**

Editor's note: "By Design" is a regular column of the *Angus Beef Bulletin* featuring facility and homestead design for cattlemen. Erin Cortus is an assistant professor and Extension specialist in the Bioproducts and Biosystems Engineering department of the University of Minnesota.