Sublette Veterinary Services

PAP Guidelines (These are courtesy of Dr. Tim Holt)

1. Animals testing over 45mmHg should always be considered a risk for high altitude use.
2. The chance of getting a false high PAP reading is very rare at any elevation, but a low score can be from several factors, including testing errors.
3. PAP scores of over 50-55mmHg have never been documented as dropping to an acceptable level.
4. Use the actual PAP score and the PAP EPD together.
    a. The EPD is best used with the actual PAP measurement in helping the buyer decide when to buy or not to buy a borderline PAP measurement. For example if a bull has a borderline actual PAP measurement of 43mmHg yet has an EPD at -2.5 then the buyer may select that animal for high altitude use. The opposite may be true for an animal having a positive EPD, regardless of the PAP measurement itself that animal should be considered at risk for high elevation use. The EPD may also be helpful in selecting a sire to be used for AI for high altitude use. Don't use bulls with a positive PAP EPD at elevation.

Factors that influence PAP measurement:

1. **Animal age at the time of testing**
    a. Must be over 16 months to use the score as a prediction of the future.
    b. Less than 1 year of age should be done only as a screening tool to eliminate extremely susceptible animals. PAP measurements in young cattle are not always predictive of PAP measurements as adults. It is advisable to retest these cattle at high altitude and after 12 months of age. This is especially important for cattle that will be used as breeding stock.
    c. If tested young, a score of <40mmHg has about a 80% chance of staying acceptable, but anything that tests over 40 is a wild card and must be re-tested before breeding.
2. **Elevation of the test**
    a. Testing under 5000 feet is no use, (5000-6500 feet is useful but re-test before use)
        i. The higher the altitude, the more accurate and reliable test results will be. Any PAP measurement taken below 5000 ft should be utilized only as a screening tool to eliminate extremely susceptible animals before they are taken to altitude rather than for genetic selection. Cattle tested at elevations of less than 5000 feet should always be retested at elevation if they are intended for breeding purposes.
    b. Testing at 7500ft or more gives much more accuracy.
    c. Because brisket doesn't show up until there is CHRONIC low oxygen, they need to be at this elevation continually for a minimum of 1 month before testing.
    d. the expectation of the PAP score is to increase approximately 1-1.5mmHg per 1000 feet elevation climb, if the initial test was taken at elevations greater than 6500 feet
3. **Breed**
    a. There isn't a breed that is immune.
    b. Living at low elevation, below 5000ft, at any time increases chances for developing problems when returned to transported to high elevations.
4. **Illness, Vaccination**
    a. Since the PAP measurement is actually a measure of lung blood flow resistance, anything causing a decrease in lung space temporary or permanent can cause an increase in the PAP measurement. Any type of respiratory or pulmonary pathology can lead to an arbitrary high PAP measurement.
        i. Don't test within 2 weeks of respiratory illness or vaccination.
5. **Pregnancy**
    a. overall there is not a consistent increase in the PAP of pregnant animals. It seems that some may have and increase while others are not affected.
    b. Don't test if over 7 months pregnant
6. **Temperature at testing**
    a. Cold environmental temperature can cause pulmonary hypertension. Temperatures less than 0 degrees Fahrenheit have been shown to increase PAP by 25% to 55%.
7. **Who is testing:**
    a. There are several ways to get a false low score, so try to find out who is doing the testing and their credentials.
    b. If you see a sale catalog full of scores in the low 30's (30-34) be concerned.

SCORE EVALUATION

The following chart has been developed to help direct the rancher in evaluating a PAP measurement for purchasing cattle for use in high altitude.

*** These figures are based on cattle tested at or above 6000 feet and 12 months of age or greater. If the animal does not meet these criteria then adjustments must be made as discussed previously.**

PAP SCORE	INTERPRETATION
30-35mmHg	In the past these scores have been considered an excellent and reliable score. In most situations they are but it should be noted that we have seen that many animals scoring this low may increase rapidly when move to higher elevations so accuracy of scores below 34mmHg are concerning.
36-39mmHg	This is considered an excellent score for any animal over the age of 12 months. If the animal is less than 12 months of age, the score is still fairly reliable but retesting prior to use is suggested.
<41mmHg	Scores less than 41mmHg are reliable measurements in all animals greater than 12 months of age. It is recommended that yearling cattle measure less than 41mmHg (depending on altitude of the test). The variation in scores 41 and above is inconsistent and difficult to predict in some cattle as they age. Any animal measuring 41 and greater should always be retested prior to use
41-45mmHg	This is an acceptable range for older animals, i.e. greater than 16 months of age. Animals less than 16 months scoring in this range should be retested to accurately predict the future of the animal
45-48mmHg	This is an acceptable range for only older animals that have been in high elevations for an extended period of time. Animals with this score are more susceptible to environmental stresses leading to HMD and should be considered at some risk. Elevation of test site and where the animal lives must be evaluated at closely for those in this PAP score range.
>49mmHg	Animals that score in this range must always be considered a high-risk candidate, not only for themselves but also their offspring. Many animals that have scored in this range have died of HMD. An option for these animals is to move them to a lower elevation for use there. It is also recommended that no offspring of these animals ever return to HA.