

BORN TO RUN

A THOROUGHBRED'S AWESOME GRACE DEFINES "HORSEPOWER"

It looks so easy. You watch the horse you bet on break from the starting gate, gallop around the turn and sprint down the homestretch. She seems to be running so smoothly, so effortlessly. But what you're watching is a marvel in motion. The thoroughbred defies physiology, says George Pratt, professor emeritus at the Massachusetts Institute of Technology and an expert in thoroughbred movement.

When a horse bursts from the starting gate, their rump digs down as much as a foot – for the same reason that your car, when you step on the gas, dips in the back and rises in the front. A thoroughbred reaches 42 MPH in 2 ½ seconds, says Pratt, who narrates a film about thoroughbred motion at the National Museum of Racing and Hall of Fame in Saratoga.

Whether you consider the horse's hoof, heart or lungs, you'll discover that the horse is made to run. Don't let the easy motion in flight, or calm demeanor at rest, fool you.

"So the horse that walks around, eats grass, looks at the view and gives every appearance of tranquility, was in fact, designed by G-d to explode says Pratt."

R BETTY GRAYBULL - POETRY IN MOTION



The Start: The horse will rabbit hop out of the starting gate, but very quickly goes into what is called a round gallop. A **round gallop** is when her feet hit the ground in this order: Right rear, left rear, left fore, right fore. A horse will hold that a few strides and then switch to a normal gallop, the **transverse gallop**: Left rear, right rear, left fore, right fore. At cruising speed, the horse moves at about 37 MPH.

BELLAGIO – PERFECT BALANCE



Legs: The main propulsion of the horse comes from the rear legs. The front legs serve to keep the front of his body up, of course, but also help a horse to stop.

Changing Leads: The American thoroughbred is in a lifelong left-hand turn. The horse goes around the turn on its left lead. That means the last leg that leaves the ground is the left foreleg. That's more comfortable when running around a turn.

It's also very tiring, because it's the leading foreleg that's needed to throw the horse into the air with. By changing leads, the horse rests those muscles needed to produce that airborne phrase. When a horse changes leads, the front leg that was going to come down - doesn't. There's a pause, and then the other leg comes down in full flight as the horse switches his weight to the other foreleg.

Lead changes, if exercised properly, usually occur going into and coming out of turns. Thus, the term "changed leads on a dime". Some horses will change leads late as the rider shifts his own body weight trying to get the horse to change leads. This usually happens in the stretch run when the jockey needs every ounce of energy from his charge. And unfortunately, some horses never change leads. The best or worst example is the champion racehorse Alydar who was the runner up in the 1977 Triple Crown to Affirmed - the last Triple Crown champion. If not for that bad habit it may have been Alydar who was crowned champion.

Heart: Each stroke of a heart pumps about 1 ¼ liters of blood per second. That's more than a quart of blood every second that surges out of the heart. From rest to top speed a horse's heart rate increases by a factor of 10. To put things in proper perspective a man's heart increases by only 4.

A good trainer will routinely take blood chemistry's on his horse. He knows the optimum chemistry when his horse usually runs a good race. And just like humans, horses have been known to have heart problems that can limit their ability to perform. A strong heart is necessary to pump oxygenated blood to the muscles.

COBRA STRIKE – THE PERFECT RACEHORSE

COMBINED GRACE, BALANCE & HEART



Eyes: The horse has monocular vision. This means its eyes move independently. But if you add each eye's range together, it can cover a range of about 330 degrees. To the horse man appears larger than he is.

Lungs: When a horse's legs hit the ground, he's exhaling. He inhales at liftoff, taking in air at the rate of about 7 gallons per second. A horse inhales and exhales once every stride. At 0.42 seconds per stride, he completes 2 ½ breathing cycles per second. He will run a mile in about 200 breaths. A horse has the ability to hold his own breath. Should this occur during a race often you may see the jockey hit the horse in full flight with his whip under the belly to force him to breathe?

Displacing: This is when a horse literally can hold his own breath making the horse appear rubber legged in the stretch run. If this occurs there are remedies that a trainer can try, and in some cases, minor surgery is indicated to correct the problem.

Hooves: The force on a horse's front hoof when it hits the ground is approximately 2 ½ times his body weight or about 2,500 pounds. There is a saying in the racing game – "No foot - No Horse." Many a great horse never realized his or her potential because of foot problems.