

OPTIMATCH

THE KEY TO BREEDING ATHLETES

The science of genetics has shown that the physical measurements of various parts of a horse are predictable to a degree by examining the comparative measurements of the horse's sire and dam. The degree to which a given measurement is predictable is called the "heritability of the measurement."

EQUIX has calculated the heritability of various bone measurements utilizing a probability curve to determine the chances of a given value for the corresponding measurement of a foal produced by a specific mating.

That's the basis of the EQUIX OptiMatch Program. OptiMatch has been used by breeders over the years...

- To plan matings which have resulted in Champions, Grade I winners, and other Graded/Group winners;
- To plan matings which have produced hundreds of other black-type winners, including state-bred champions;
- To plan matings which have produced hundreds of weanlings, yearlings or two-year-olds which have either been sale toppers, or returned substantial profits on their production costs by simply "outselling their pedigrees."

PROBABILITY MADE SIMPLE

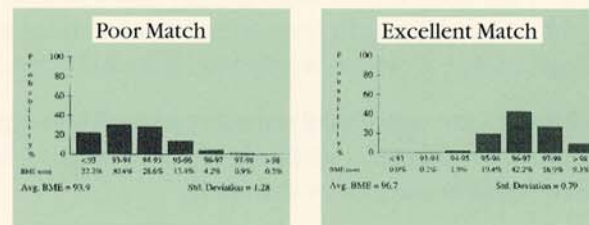
On the surface and in its simplest terms, OptiMatch calculates the trillions of possible foals from a given mating. Using a random sample of 1,000 foals, the program determines the average predicted biomechanical efficiency scores for that mating at both 30 and 48 months of age.

This probability is presented in a bar chart (see top of next column). Since each mating is an *average projection*, the actual live foal should attain a BME Score of 0.5 to 1.0 higher than the score given at 48 months.

The OptiMatch Program represents the best known way to produce predictable balance for the foal in any mating. Obviously, the more alike the sire and dam (with sex differences taken into consideration), the more likely that the foal will be structured like its parents.

EQUIX retains an active data base of the measurements stallions in North America and other countries. After EQUIX examines a mare and enters her measurements into our data base, OptiMatch compares her with all stallions within a specified client-selected stud fee range and/or in a specified region to find the mating that will give the highest probability of producing a well-balanced foal.

Below are two examples of OptiMatch projections for the same mare:



KEY TO READING OPTIMATCH CHARTS

OptiMatch BME Scores tend to be as much as a point lower on average than the BME Scores of actual live horses produced by a given mating, as illustrated below.

Relative Quality Match	Average BME Score
A+ (Outstanding)	97.1 and above
A (Excellent)	96.9 to 97.0
A- (Very Good to Excellent)	96.7 to 96.8
B+ (Very Good)	96.5 to 96.6
B (Good - About Average)	96.3 to 96.4
B- (Fairly Good)	96.1 to 96.2
C+ (Fair to Fairly Good))	95.9 to 96.0
C (Fair)	95.5 to 95.8
D (Poor)	95.1 to 95.4
F (Very Poor)	95 and Below

The Average BME Score rating is the average for all foals possible from the mating. As a rule, high Average BME Scores and low standard deviations are desired. The standard deviation measures the amount of "deviation" from that score likely to occur in the actual foal.

For example, if the Average BME Score is 96.0 and the standard deviation is 1.25, then about 68.3% of the foals should have BME Scores of between 94.75 and 97.25, which is one standard deviation below and one above the Average BME Score.

breeding athletes

OPTIMATCH

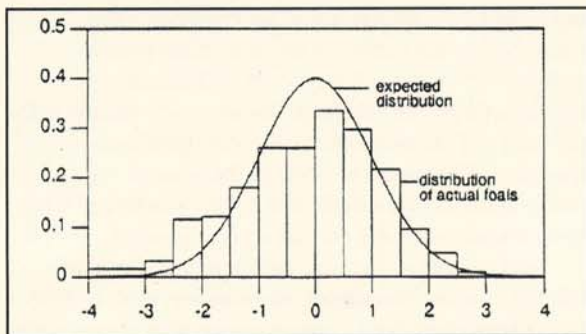
HOW DO WE KNOW THAT OPTIMATCH WORKS?

The data from one EQUIX study indicate that an OptiMatch BME Score projection of 96.5 or higher will produce, on average, a racehorse having over twice the average earnings per start (SSI), and a 35% better chance of winning a stakes (or placing in a Graded stakes), than a horse produced from a lower projected BME Score.

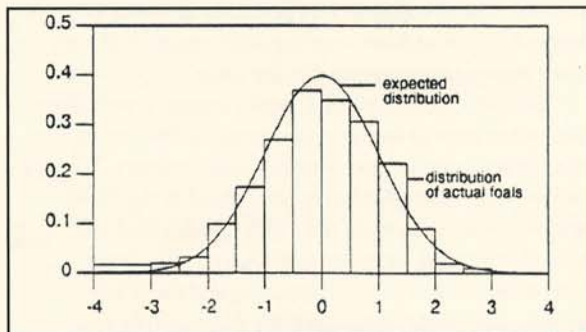
Projected Score	> 96.5	< 96.5
# Matings	144	553
Average SSI	4.39	2.17
%SWs or GrSp	20.8%	15.4%

Data from another study of the actual BME Scores of more than 300 foals produced from mares in our data base compared with the projected Average BME scores as predicted by their OptiMatches show the probability distribution of both scores are extremely close.

Probability Distribution of BME Scores Actual OptiMatch Foals vs. Predicted OptiMatches



DIFFERENCES AT 30 MONTHS OF AGE



DIFFERENCES AT 48 MONTHS OF AGE

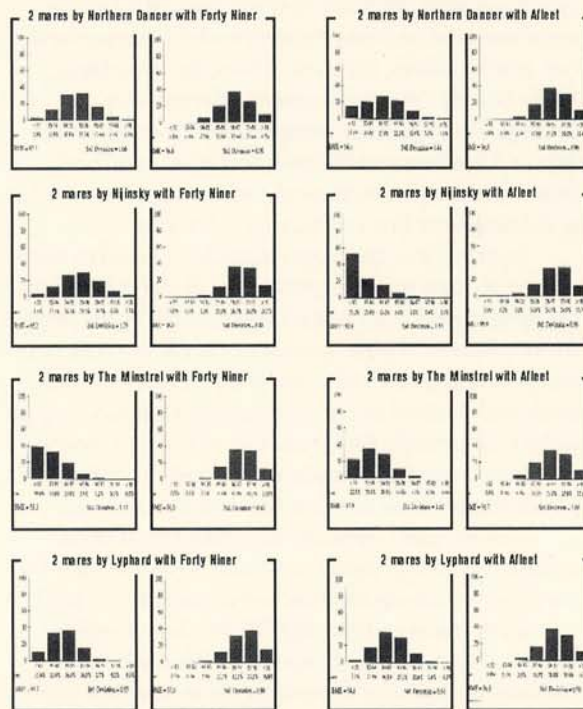
NICKING PATTERNS

OptiMatch has shown that certain sires, and some of their sons, match well with some daughters of another sire—*ie.*, “a phenotypical nick.” *This has been a clear advantage to breeders who seek to confirm the potential of such nicks within their own broodmare bands.*

Thus, where clear nicking patterns have been detected through pedigree analysis, these same nicking patterns can sometimes show up as phenotypical nicking patterns

However, *the advantage in the OptiMatch program is to spot the exceptions to the rule.*

Below are OptiMatch charts reflecting the range of probability of a given foal's BME Score at 48 months for various mares by Northern Dancer and three of his sons when mated with Forty Niner and Afleet, two prominent sons of Mr. Prospector who have been exported. This is a pedigree cross which has produced over 300 stakes winners, but clearly



shows—in advance—which “nicks” are for real. (Poor matings are on the left of each grouping.)

Breeders have discovered that OptiMatch helps them to spot nicks well in advance of pedigree analysis because the program is a projection into the future, not an analysis of what has happened in the past. As such, they can invest in sire, or broodmare sire, lines before the rest of the market discover the trends. This service is of tremendous value in an industry whose very foundations is “betting on the future”

Projection

STALLION ANALYSIS:

BEFORE THE FOALS HIT THE GROUND

For many years, EQUIX has published an annual survey of Freshmen Sires which we believe have an outstanding chance of success based on their biomechanics. The survey, called "Out on a Limb," is published as an edition of our *EQUIX-Pix* newsletter.

In earlier years, the mission was to point out which stallions may have been overlooked by the marketplace, but which consistently matched up very well with our clients' mares on the OptiMatch Program from the time they entered stud. EQUIX was especially interested in pointing out stallions who were undervalued at the time, so that breeders might have an opportunity to consider sending mares, or purchasing shares at reasonable prices.

As such, many of the more commercial stallions of the early 1980s, some with very good biomechanical profiles, were not listed as "good buys," under the criteria applied. Even so, over the years, it is hard to argue with the success of a survey which has pointed out, among others, the likes of **Danzig, Fappiano, Forty Niner, Cryptoclearance, Farma Way, Trempolino, Quiet American, Two Punch, Wild Again, Cozzene** and **El Gran Senor**, as good bets based on their biomechanical profiles and relative value at the time their first crops came to the races.

Prior to 1992, the main research tool used to hone our predictions was "sample books" of mares based on the general distribution of biomechanical "types" within the population. These "books" of excellent, moderate and poorly constructed mares were "tested" with all measured stallions in each respective Freshman crop in order to determine which ones were likely to succeed. (*Stallions whose mechanics match a wider variety of physical types tend to be more consistent as sires*).

This program remains a key component of our stallion research program today and forms the basis for our *New Sire Sneak Preview* service initiated in 1997.

Subsequent to 1992, EQUIX developed another analytical tool, the LandScape, which measures a stallion's potential by comparing his mechanics with those of successful sires, past and present, predicting an Average-Earnings Index based on how closely his mechanics compare to actual AE-Is of other stallions.

These two programs have become the basis for reports which EQUIX began to make available to owners of stallions and stallion prospects during the mid-1990s. In some cases, stallion prospects have been either retained by their original owners or stallion managers have made a substantial investment based on the reports.

Perhaps one of the most important services EQUIX offers breeders and stallion managers is the ability to spot *changes in the way the breed is likely to develop based on the prevalence of certain physical properties within the majority of the breeding population*.

While EQUIX clients have always had the benefit of this insight, in recent years we have utilized our newsletter, *EQUIX-Pix*, to make certain observations. For example, we pointed out how nicks actually develop among sire lines from a biomechanical perspective, as in the case of Mr. Prospector and daughters of Buckpasser.

At other times we have pointed out Phenotypical differences between Thoroughbreds which are imported to North America from South America. In many cases, these differences might not mean all that much on the racetrack; but it has meant a great deal when South American horses move into the breeding population.

One of the more important findings of EQUIX's research came early in the 1990s. We discovered a pattern was beginning to emerge among sons of Mr. Prospector, specifically that one of his sons, Fappiano, had a very serious chance of establishing an exceptionally strong sire line of his own.

It should be remembered that Fappiano's son, Unbridled, won the Kentucky Derby in 1990—the first time a male-line descendant of Mr. Prospector had triumphed in this event. At the time, most pundits attributed the horse's ability to get 10 furlongs to his broodmare sire, *Le Fabuleux. However, by then EQUIX had analyzed the biomechanics of enough sons and daughters of Fappiano to come to the general conclusion that *this was the son of Mr. Prospector who could break out on his own as a breed-shaper*.

And we said so in print, well before the vast majority of other bloodstock advisory services. In 1993, EQUIX predicted that Cryptoclearance would eventually head the Freshmen Sire crop of 1993 based on long-term success. The prediction was generally ignored, or derided, by those who were far more enamored with other more glamorous sires in the crop.

By 1998, not only was Cryptoclearance well ahead of all other sires in his crop in several categories, but he was the only one to have sired a Classic winner—Victory Gallop, who triumphed over Real Quiet in the 1998 Belmont Stakes. Indeed, the 1998 Classics basically proved our point, because Real Quiet's sire, Quiet American, is also a son of Fappiano, and these two horses completely dominated the Classics that year.

breed-shapers