

THE IBERIAN GRAZER: A GUIDE FOR BREEDERS¹

THE BIG PICTURE

The Iberian Grazer is a **hybrid** heritage pig designed to efficiently produce flavorful, beefy-tasting, red, well-marbled pork in an outdoor, small farm, pasture setting. It is built on four heritage breeds. The base breed is the renowned **Iberico**. The Chinese **Meishan** contributes prolificacy, superb taste, and an unusual ability to digest fiber from grazing. The **Red Wattle** and **Berkshire**, also known for their great taste, offer faster, more efficient growth. Together, like a chorus, they all contribute to that harmony of the hybrid—hybrid vigor.

WHAT WILL IT LOOK LIKE?

The Iberian Grazer's eventual physical appearance is still evolving. But, based on several years of heritage pig crossbreeding work at Glendower Farms, beginning in 2019, this pasture pig's visual image is coming into focus. In short, it will probably resemble a somewhat bulky, well-muscled Iberico with lots of teats—much like the early-version cross shown here. It will be a black, medium-sized, athletic-looking pig with loped ears and sturdy, somewhat straight legs designed for mobility on pasture. It may have signature wattles under its jaw.



WHAT ARE THE CHARACTERISTICS OF THE IBERIAN GRAZER

Iberian Grazer production is meant to be “**bioeconomical**.” In other words, it’s biologically sound (environmentally friendly and sustainable). At the same time, it is economically viable and efficient. It should meet the challenges of growing pigs humanely while being good stewards of the land. It should be environmentally and financially sustainable (i.e., profitable), even for a small farmer.

So, what characteristics does a pig need to accomplish this ambitious goal?

- **It “eats good.”** The Iberian Grazer aims to bring back the “old-fashioned” meat-eating experience that made pork the world’s favorite, most consumed meat. It “eats good” means a combination of flavor, texture, juiciness, chew, and mouth feel that makes good heritage pork a satisfying gastronomic delight. When raised in an outdoor environment, and in the hands of a competent cook, these four breeds bring together the genetics and exquisite fat profile that can make that “eats good” experience happen. It’s a pig that can generate repeat customers once they’ve tried Iberian Grazer pork.
- **It has large litters.** Cost-effective, efficient pork production requires large litters, which most heritage breeds can’t match, except for the Meishan. Thanks to its Meishan genetics and a boost from hybrid vigor, the Iberian Grazer should yield large litter sizes that are comparable to most modern commercial pig operations—but outdoors on pasture, rather than in a factory-style building with huge waste lagoons.

- **It has faster, efficient growth.** We don't expect the Iberian Grazer to be the fastest growing pig on the market, because we don't want the sacrificed meat quality that comes with ultra-fast growth rates. Instead, we want a growth rate that enables this hybrid pig to reach harvest weight efficiently and cost-effectively, without compromising its superior meat quality.
- **It thrives on pasture.** There are two good reasons to grow pigs outdoors in a pasture setting. First, the pigs like it! There, they can express their natural instincts to forage, explore, root, wallow, socialize—to do what pigs love to do. Second, it improves their meat. The exercise increases myoglobin production, which contributes to the beefy-red color of their meat. Exercise also helps distribute flavor-carrying fat between and within their muscle fibers. The forages they graze significantly boost their meat's healthy high oleic and omega-3 fatty acids, the antioxidant Vitamin E, plus Vitamins D, A, and K. The Iberian Grazer is bred especially for a pasture setting, not an indoor pig factory.
- **It's good-looking—for a pig.** No animal breeder wants to sacrifice production for appearance—and they shouldn't. But if both are possible, it's a big win! It's human to admire our animals. Plus, it makes them easier to sell to specific market segments, enhancing potential profitability. So, the balanced, harmonious, robust look of the pig is a good thing! Even the unique signature wattle can be a distinguishing feature, setting it apart from most other pigs.

THE GENETICS OF THE HYBRID

Amateur animal breeders are often fixated on the “pure.” They want animals that are uniform look-alikes, that come from a lengthy unbroken pedigree chain, and whose differences can be resolved by breeding them toward an elusive state of perfection often called a “standard.” This “pure is better” way of thinking has its place—the genetics of the hybrid would be impossible without it—but it also has its traps, especially in breeds with smaller populations. Despite the desirable traits a particular breed may carry, a buildup of recessive gene pairings for deleterious traits can result in *inbreeding depression*. The outcome is usually a decline in vigor and fertility. At its extreme, the entire breed dies. The cure is the thoughtful introduction of new genetic material from another gene pool. Modern DNA studies show that many successful but quite old breeds have undergone *introgressions* of outside genetic material that helped the breed adapt and survive the threat of inbreeding depression. In other words, at some point in their breed history, they were *crossbred* to introduce this new genetic material.

Crossbreeding unlocks and enhances the expression of the desirable genes in an insular purebred population. Inbreeding depression, if it is present, is replaced by *heterosis*, or **hybrid vigor**. The most common explanation is that *homozygous* deleterious recessive gene pairings are replaced with *heterozygous* gene pairs that carry a dominant gene for desirable traits. Bingo! Problem solved. While the complete explanation is more complex, the bottom line is that crossbreeding works! Traits such as growth rate, litter size, piglet survival, and longevity all benefit significantly from heterosis in crossbreeding.

The greatest heterosis (or hybrid vigor) effects from crossbreeding occur in the F1 matings, the first generation. Generally, the more *genetic distance* (genetic differences) between the F1 parents, the more dramatic the hybrid vigor. Though many benefits arising from combining two or more breeds will persist, the effects of hybrid vigor tend to decline in subsequent generations. The best way to capture and retain these hybrid vigor effects through many generations is to use more breeds to initiate the hybrid. An extensive long-term study in beef cattle at a USDA research station in Nebraska indicated that

75-80% of the hybrid vigor effect could be retained indefinitely if four breeds were used in the initial cross, provided inbreeding was avoided. For two breeds, it was no more than 50% retention.

The Iberian Grazer uses four breeds of heritage pigs that, together, have the traits we want to achieve the characteristics described above. All four are separated by significant genetic distance from one another. For example, the Meishan and Iberico appear to have been genetically isolated for over 2000 years. These four breeds are an ideal combination for creating a sustainable cross that will maintain the desirable traits needed to meet the goals we have outlined for a hybrid pig. After multiple generations, that hybrid pig might eventually become a composite breed. A stable composite breed is much easier to manage than the complex rotational crossbreeding plans that are required to initiate the process.

HOW TO BEGIN

So, how do we begin with the above ends in mind? There is no single perfect path. But based on work already done over the past six years at Glendower Farms, there are a couple of manageable paths with a high probability of success in the shortest timeframe.

While we want to provide the early breeder of Iberian Grazer hybrids with the flexibility to try different combinations of the four breeds, we also want to set some boundaries to help stay on track and avoid random, chaotic matings. Here is a protocol that establishes those boundaries.

The protocol allows the Iberico (I) ratio to vary from 25% to 75% to provide flexibility for introducing the three other breeds into the crossing mix. It requires that the Meishan (M) always represents at least 1/8 of the genetic contribution, and that either the Berkshire (B) or the Red Wattle (R) has at least a 1/8 contribution. So at least three of the four breeds must always be present in the crossing mix. No breed, other than Iberico, could ever represent more than 5/8 of the mix.

MATING PLANS THAT WORK

The ultimate goal, of course, is to have all four breeds in the mix. Here are two proposed three-step mating schemes that could make that mix happen in the shortest possible time. Both have two possible endpoints, though a 4-breed cross would be needed for eventual registration. The formulas shown here represent 1/8 parts of a particular breed. The subscripts represent the sex (**m**ale or **f**emale) of the parent. For example, 8B_m signifies a purebred Berkshire (B) boar parent (8 of 8 parts, male); 4R:4M_f means a crossbred female that is half Red Wattle and half Meishan.

MATING SCHEME I

STEP 1

MATING A1: 8I_m x 8M_f => 4I:4M (use in Step 2)

MATING A2: 8I_m x 8M_f => 4I:4M (unrelated pairs; use this one in Step 3)

MATING B: 8B_m x 8R_f => 4B:4R

STEP 2

MATING C: $4B:4R_m \times 4I:4M_f \Rightarrow 2I:2M:2B:2R^*$

(This 4-breed mating qualifies for an Iberian Grazer designation & possible future registration.)

STEP 3

MATING D: $2I:2M:2B:2R_m \times 4I:4M_f \Rightarrow 3I:3M:1B:1R^{**}$

(This mating uses a dam from A2 and qualifies for possible Iberian Grazer future registration.)

The third step of this mating scheme yields a hybrid pig that is **3/8 Iberico, 3/8 Meishan, 1/8 Berkshire, 1/8 Red Wattle**. Step 2 on this path also produces a hybrid pig that is **1/4 Iberico, 1/4 Meishan, 1/4 Berkshire, and 1/4 Red Wattle**.

MATING SCHEME II

STEP 1

MATING A: $8R_m \times 8M_f \Rightarrow 4R:4M$

MATING B: $8B_m \times 8M_f \Rightarrow 4B:4M$

STEP 2

MATING C: $8I_m \times 4R:4M_f \Rightarrow 4I:2M:2R$

(This 3-breed mating qualifies for an Iberian Grazer designation.)

MATING D: $8I_m \times 4B:4M_f \Rightarrow 4I:2M:2B$

(This 3-breed mating qualifies for an Iberian Grazer designation.)

STEP 3

MATING E: $4I:2M:2B_m \times 4I:2M:2R_f \Rightarrow 4I:2M:1B:1R$

(This 4-breed mating qualifies for an Iberian Grazer designation & possible future registration.)

The third step of this mating scheme yields a hybrid pig that is **1/2 Iberico, 1/4 Meishan, 1/8 Berkshire, 1/8 Red Wattle**.

Either of these mixes should achieve the objectives outlined above, though others may do so equally well.

MOVING TOWARD A COMPOSITE BREED

Ultimately, to simplify breeding management for breeders and growers, the Iberian Grazer should aspire to become a *composite breed* and exit the hybrid stage. Thinking ahead, here are some rules and guidelines Iberian Grazer hybrid breeders could adopt to make a composite breed possible in a reasonable timeframe. These rules assume that today's Iberian Grazer breeder is positioning at least some of their animals for entering into a registry for purebred Iberian Grazers.

1. Iberian Grazer breeders need a registry that can track all matings that might eventually achieve registered status as composite purebred Iberian Grazers. This registry might coexist alongside another purebred registry, such as one for purebred Iberico pigs.
2. The registry would work toward building a 5-generation pedigree (includes the 16 great-great-grandparents). Using special registry software, it will track the percentage of each of the four breeds in each animal. It will compute a coefficient of inbreeding for each animal. Entry into the registry will require DNA test verification of parentage for all animals that are intended for breeding stock. For planning matings, the online registry software would allow “test” matings before breeding.
3. The registry would establish a “Founder” status for those pigs eligible to be in the first group of Iberian Grazers to be designated as registered purebreds. To qualify for “Founder” status, a pig should readily meet the established Breed Standards. It would have to be at least 1/4 Iberico, 3/16 Meishan, 1/8 Berkshire, and 1/8 Red Wattle. It should have a 5-generation Coefficient of Inbreeding (COI) of 0.00, meaning it has no common ancestors in its 5-generation pedigree.
4. The initiation of a composite breed of Iberian Grazers would not be declared before: (1) there is at least 1000 animals in the Iberian Grazer registry database; (2) there is at least 100 pigs with “Founder” status in the Iberian Grazer registry database; (3) there is at least 30 different active boars with “Founder” status being used in each new generation; (4) the COI of the new herd population of “Founder” pigs is less than 0.02. Until ALL of these conditions are met, the breed should remain in “hybrid” status and freely open to new introductions.
5. No Iberian Grazer pigs with a COI greater than 0.05 would be eligible for registration as a purebred Iberian Grazer.
6. Once the population of registered Iberian Grazers reaches at least 2000 animals, the herd book could undergo a “soft” close. At no time should the herd book be completely (“hard”) closed. A “soft” close means that new genetics could be continually introduced by repeating the process used to develop the initial “Founder” animals. Furthermore, introductions that the registry association determined to be exemplary could be designated as new “Founder” animals, thus ensuring the long-term genetic health of the breed.

These rules should give Iberian Grazer breeders a sound start in building a productive hybrid pig that evolves into a composite breed. However, as breeders' collective experience grows, they should periodically review these rules and guidelines in consultation with professional animal geneticists and tweak or modify them as conditions and experience dictate.

¹ Author Hines Boyd is an owner of Glendower Farms, where the Iberian Grazer began its evolution from a group of purebred Iberico pigs that came from a herd he helped two Spanish entrepreneurs bring from Spain in a pioneering 2014 import. Boyd is a sixth-generation North Florida farmer and agriculturist. He earned a PhD in Agriculture at the University of Florida. There, he studied under renowned animal geneticist Dr. Marvin Koger, whose work in crossbreeding helped transform cattle breeding in the Southern U.S. and tropical environments—and heavily influenced Boyd’s work on the Iberian Grazer hybrid pig.