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John M. Moye

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The Court of Appeals of North Carolina's Narrow Approach to Trade Secrets Protection in *North Carolina Farm Partnership v. Pig Improvement Company*

For many, the phrase “pig breeding” conjures up images of muddied, hard-working farmers and crudely-constructed pig pens in the countryside. And yet pig breeding today is far removed from such rural scenes. Take, for example, the Pig Improvement Company (“PIC”), a U.S. company with offices in thirty countries around the world.¹ Over the last forty years, PIC has invested millions of dollars in confidential research and development on the genetic improvement of pigs.² The company engages in a sophisticated process of pig breeding—identifying the desirable traits in pigs and then running selective breeding programs in order to produce pigs with enhanced genetic make-ups.³ The market for such selective pig breeding is substantial.⁴ PIC’s years of research have spawned pigs that are both larger and leaner than other pigs, thereby making them more desirable for commercial pork producers.⁵ In light of the fact that pork is now the most widely eaten meat in the world,⁶ PIC’s monetary investments in developing larger and leaner pigs have bestowed substantial benefits on the pork industry.⁷

Unfortunately, last year the Court of Appeals of North Carolina ignored these sizeable investments, as well as the benefits they have produced. In *North Carolina Farm Partnership v. Pig Improvement*

1. See PIC Int’l Group, About Us, at http://www.pic.com/about_us/ (last visited Aug. 25, 2005) (on file with the North Carolina Law Review).

2. Defendant-Appellant’s Brief at 16, *N.C. Farm P’ship v. Pig Improvement Co.*, 163 N.C. App. 318, 593 S.E.2d 126 (2004) (No. COA03-328).

3. See PIC Int’l Group, Business Model, at http://www.pic.com/./about_us/business_model.asp (last visited Aug. 25, 2005) [hereinafter PIC Int’l Group, Business Model] (on file with the North Carolina Law Review).

4. *Id.* (stating that the company supplies breeding stock to the largest pork producers in the world).

5. See Defendant-Appellant’s Brief at 16, *N.C. Farm P’ship* (No. COA03-328) (claiming that PIC’s genetic methods have led to “improved litter size, growth rate, and lean tissue percentages” in its pigs).

6. See Nat’l Pork Producers Council, Facts and Figures, at <http://www.nppc.org/resources/facts.html> (last visited Aug. 25, 2005) (on file with the North Carolina Law Review).

7. See PIC Int’l Group, Business Model, *supra* note 3 (“PIC delivers significant value to its customers in an industry where continual genetic improvement can be a key factor in helping ensure a pig producer remains competitive.”).

Co.,⁸ the court of appeals affirmed a lower court decision holding that the North Carolina Trade Secrets Protection Act⁹ does not protect genetically-enhanced living organisms.¹⁰ The court made it clear that if another company were to obtain one of PIC's enhanced pigs, it could freely breed them without incurring liability¹¹—this, despite the fact that every generation of pigs would pass to the next the PIC-engineered pig's proprietary genetic information.¹²

While *North Carolina Farm Partnership* solely addressed the narrow issue of trade secret protection for genetically-modified pigs, the potential impact of the court's opinion is more far-reaching. In the wake of the *North Carolina Farm Partnership* holding, companies that currently conduct confidential genetic research on animals—or plants for that matter—will not be able to invoke North Carolina trade secrets law to protect the genetic messages encoded in the organisms, should one of them be wrongfully misappropriated by a competitor.

This Recent Development argues that the Court of Appeals of North Carolina failed to properly recognize that the North Carolina Trade Secrets Protection Act (“the Act”) includes the protection of genetic codes contained in living organisms. In light of the Act's broad language, the way the Act has historically been interpreted by North Carolina courts, and analogous cases from other jurisdictions, this Recent Development posits that the *North Carolina Farm Partnership* court should have recognized that genetic messages encoded in living organisms are proper “trade secrets” under the Act.

This Recent Development further argues that the court should have considered the policy arguments articulated by the United States Supreme Court in *Diamond v. Chakrabarty*,¹³ the landmark case in which the Court held that the federal Patent Act¹⁴ included patent protection for living organisms.¹⁵ While the rubrics of patent law and trade secrets law have distinct purposes—the former to promote the disclosure of scientific inventions, the latter to protect the confidentiality of such inventions—they share the common goal of incentivizing research by extending legal protection to products of

8. 163 N.C. App. 318, 593 S.E.2d 126, *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004).

9. N.C. GEN. STAT. § 66-152 to -157 (2003).

10. *N.C. Farm P'ship*, 163 N.C. App. at 323–24, 593 S.E.2d at 130–31.

11. *Id.* at 324, 593 S.E.2d at 131.

12. *See* Defendant-Appellant's Brief at 17, *N.C. Farm P'ship* (No. COA03-328).

13. 447 U.S. 303 (1980).

14. 35 U.S.C. §§ 1–376 (2000).

15. *Diamond*, 447 U.S. at 318.

human ingenuity and originality.¹⁶ In that sense, *Diamond* helps shed light on the larger aspirations of intellectual property law in general.

As a final matter, this Recent Development argues that the genetic enhancement of plants and animals will yield substantial medical, agricultural, and commercial benefits. The court's failure to recognize any trade secrets protection in this area will stifle progress in the field, hurting both consumers and businesses.

The *North Carolina Farm Partnership* case originated as a dispute over a lease agreement.¹⁷ North Carolina Farm Partnership ("NCF") was a multiplier farm¹⁸ that agreed to lease both pigs and facilities in Warren County, North Carolina, to PIC.¹⁹ PIC was to use the leased facilities for pig breeding.²⁰ When the four-year lease between the parties terminated, PIC failed to exercise its option to purchase all of the genetically-modified pigs that it had bred at the site.²¹ NCF then indicated that it intended to sell these modified pigs for further breeding, while PIC maintained that the lease agreement contemplated that NCF could sell the modified pigs for slaughter but not for breeding. Faced with the prospect that its pigs would be sold by NCF for further breeding, PIC first moved for a temporary injunction in an Iowa district court; that injunction was granted in January 2002.²² The Iowa court's injunction prohibited NCF from selling as breeding pigs any of the 450 PIC pigs that NCF had relocated to that state.²³ Meanwhile, in April 2002, PIC filed a separate motion for a temporary injunction in the Warren County Superior Court, alleging that NCF's plans to sell the pigs for breeding constituted misappropriation of a trade secret—in this case, the genetics within the pigs—which PIC had developed at great expense.²⁴ The trial court refused to recognize that animal gene lines are a trade secret, and denied PIC's motion for an injunction against NCF.²⁵ The court of appeals affirmed this decision, holding that the

16. See, e.g., 2 MELVIN F. JAGER, TRADE SECRETS LAW § 11.2 (2004) ("Although trade secrets and patents have many similar intellectual property attributes, and accomplish many of the same public policy goals, they differ markedly . . .").

17. *N.C. Farm P'ship v. Pig Improvement Co.*, 163 N.C. App. 318, 319, 593 S.E.2d 126, 127, *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004).

18. A "multiplier farm" consists of land and buildings that PIC leases from third parties for purposes of raising and breeding pigs.

19. *N.C. Farm P'ship*, 163 N.C. App. at 319, 593 S.E.2d at 127.

20. *Id.*

21. See *PIC USA v. N.C. Farm P'ship*, 672 N.W.2d 718, 720–21 (Iowa 2003).

22. *Id.* at 719–20.

23. *Id.* at 721.

24. *N.C. Farm P'ship*, 163 N.C. App. at 319, 593 S.E.2d at 128.

25. *Id.* at 320–21, 593 S.E.2d at 128–29.

scope of the North Carolina Trade Secrets Protection Act did not include genetically-modified animals, and that there was no “irreparable harm” warranting injunctive relief.²⁶

The North Carolina Trade Secrets Protection Act²⁷ was enacted in 1981²⁸ with the goal of protecting a company’s “interest in information that is both confidential and commercially valuable.”²⁹ The Act prohibits the “acquisition, disclosure, or use of a trade secret” without express or implied consent.³⁰ The Act utilizes broad statutory language in its definitions section, referring not only to eight general categories of information that will connote a trade secret, but also making clear that a trade secret should include, but not be limited to, these eight categories.³¹ A “trade secret” is defined as any “business or technical information, including but not limited to, a formula, pattern, program, device, compilation of information, method, technique, or process”:³² (1) that “derives . . . commercial value from not being generally known or readily ascertainable through independent development or reverse engineering”;³³ and (2) that its owner has kept reasonably secret.³⁴ To prevail under the Act, the owner of the trade secret must prove a misappropriation by showing that the opposing party knew or should have known of the secret nature of the information, and that the party acquired, disclosed, or used the information without the consent of the owner.³⁵ If a misappropriation of a trade secret is proven, the “actual or threatened misappropriation . . . may be preliminarily enjoined” by the court while the action is pending, and permanently enjoined for a period of time if the court finds that a misappropriation has occurred.³⁶ Monetary damages may be awarded as well.³⁷

26. *Id.* at 324, 593 S.E.2d at 131.

27. N.C. GEN. STAT. § 66-152 to -157 (2003).

28. Trade Secrets Protection Act, ch. 890, 1981 N.C. Sess. Laws 1326 (codified at N.C. GEN. STAT. §§ 66-152 to -157 (2003)).

29. Joseph E. Root III & Guy M. Blynn, *Abandonment of Common Law Principles: The North Carolina Trade Secrets Protection Act*, 18 WAKE FOREST L. REV. 823, 823 (1982).

30. § 66-152(1).

31. *Id.* § 66-152.

32. *Id.* § 66-152(3).

33. *Id.* § 66-152(3)(a).

34. *Id.* § 66-152(3)(b).

35. *Id.* § 66-155. See *Combs & Assoc. v. Kennedy*, 147 N.C. App. 362, 369, 555 S.E.2d 634, 639 (2001) (discussing remedies for misappropriation, but declining to find a trade secret).

36. § 66-154(a).

37. *Id.* § 66-154(b)–(c).

In analyzing what constitutes a trade secret under the Act, North Carolina courts have typically relied upon the six factors articulated by the Court of Appeals of North Carolina in *Wilmington Star-News, Inc. v. New Hanover Regional Medical Center*.³⁸ In that case, the court reviewed judicial interpretations of trade secrets statutes in other jurisdictions and adopted from them six factors that should be considered in evaluating a trade secret claim:

1) [t]he extent to which information is known outside the business; 2) the extent to which it is known to employees and others involved in the business; 3) the extent of measures taken to guard secrecy of the information; 4) the value of information to business and its competitors; 5) the amount of effort or money expended in developing the information; and 6) the ease or difficulty with which the information could properly be acquired or duplicated by others.³⁹

The *Wilmington Star-News* factors have since been applied in a number of North Carolina trade secrets cases.⁴⁰ Various types of confidential information have been recognized as trade secrets under the Act⁴¹—among them internal “cost history” records,⁴² price lists,⁴³

38. 125 N.C. App. 174, 480 S.E.2d 53, *appeal dismissed*, 346 N.C. 557, 488 S.E.2d 826 (1997). These six factors mirror the six factors set forth in RESTATEMENT (FIRST) OF TORTS § 757, cmt. B (1939), which addresses trade secrets.

39. *Wilmington Star-News*, 125 N.C. App. at 180–81, 480 S.E.2d at 56 (citing *Ecolab, Inc. v. Paolo*, 753 F. Supp. 1100, 1111–12 (E.D.N.Y. 1991)).

40. See, e.g., *Area Landscaping, LLC v. Glaxo-Wellcome, Inc.*, 160 N.C. App. 520, 525–26, 586 S.E.2d 507, 511–12 (2003) (applying the six factor *Wilmington Star-News* test to landscaping irrigation information disclosed to a competitor during a bidding process, and concluding that the information was not a trade secret because steps were not taken to ensure its secrecy); *Combs*, 147 N.C. App. at 363–70, 555 S.E.2d at 640 (applying the *Wilmington Star-News* test to a company’s internal e-mails and documents and concluding they were not trade secrets because the information was not adequately secret); *State ex rel. Utils. Comm’n v. MCI Telecomm. Corp.*, 132 N.C. App. 625, 634, 514 S.E.2d 276, 282 (1999) (applying the *Wilmington Star-News* test to local telephone service providers’ access line reports and concluding that the reports were trade secrets under the six-prong test).

41. For a thorough discussion of the various types of data that have been recognized as trade secrets under the Act, see David P. Hathaway, Comment, *Is the North Carolina Trade Secrets Protection Act Itself a Secret, and Is the Act Worth Protecting?*, 77 N.C. L. REV. 2149, 2176–86 (1999).

42. *Drouillard v. Keister Williams Newspaper Servs.*, 108 N.C. App. 169, 171–73, 423 S.E.2d 324, 325–27 (1992), *discretionary review denied*, 333 N.C. 344, 427 S.E.2d 617 (1993).

43. *Wilmington Star-News*, 125 N.C. App. at 179–82, 480 S.E.2d at 55–57.

market forecasts,⁴⁴ customer lists,⁴⁵ computer programs,⁴⁶ methods for processing yarn,⁴⁷ and methods for modifying centrifuges.⁴⁸

The court's opinion in *North Carolina Farm Partnership* is relatively brief, providing scant insight as to why the genetics within PIC's pigs would not be entitled to trade secrets protection. In evaluating PIC's trade secrets claim, the court did not apply the familiar six-prong *Wilmington Star-News* test.⁴⁹ Nor did the court examine under which categories of section 152 of the Act—if any—the genetic information within a living organism might fall. Rather, the court of appeals based its holding on two main factors. First, the court claimed that PIC's trade secret claim was not sufficiently specific and did not demonstrate "irreparable harm."⁵⁰ Second, the court expressed reluctance over extending the protections of the Act to living animals,⁵¹ presumably because they are not expressly mentioned in the language of the Act. Upon closer scrutiny, however, neither of these reasons justifies the outcome of *North Carolina Farm Partnership*.

The *North Carolina Farm Partnership* court stated that PIC's claim failed to show the "existence of a trade secret."⁵² Earlier North

44. N.C. Elec. Membership Corp. v. N.C. Dep't of Econ. & Cmty. Dev., 108 N.C. App. 711, 718–19, 425 S.E.2d 440, 444–45 (1993).

45. Consol. Textiles v. Sprague, 117 N.C. App. 132, 134, 450 S.E.2d 348, 349 (1994).

46. Barr-Mullin, Inc. v. Browning, 108 N.C. App. 590, 596–97, 424 S.E.2d 226, 230–31 (1993).

47. Moore v. Am. Barmag Corp., 710 F. Supp. 1050, 1058–61 (W.D.N.C. 1989), *aff'd*, 15 U.S.P.Q.2d (BNA) 1829 (Fed. Cir. 1990).

48. Travenol Labs. v. Turner, 30 N.C. App. 686, 694–95, 228 S.E.2d 478, 485 (1976) (applying North Carolina trade secrets law before passage of the Trade Secrets Protection Act).

49. N.C. Farm P'ship v. Pig Improvement Co., 163 N.C. App. 318, 322–24, 593 S.E.2d 126, 130–31 (analyzing PIC's trade secret claim by evaluating the statutory language and case law, but not mentioning *Wilmington Star-News*), *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004). Had the court of appeals properly taken the approach suggested by *Wilmington Star-News*, the court would have first applied each of the six factors to PIC's case in order to determine whether the genetic information in PIC's pigs was a trade secret. It should have used this six-step analysis even if it was quite ambivalent over whether the genetics in PIC's pigs were proper trade secrets. Indeed, the *Wilmington Star-News* court made clear that an ultimate decision as to what "constitutes" a trade secret should only be reached after a court applies the six-factor test. *See Wilmington Star-News, Inc. v. New Hanover Reg'l Med. Ctr.*, 125 N.C. App. 174, 180–82, 480 S.E.2d 53, 56–58, *appeal dismissed*, 346 N.C. 557, 488 S.E.2d 826 (1997).

50. *See N.C. Farm P'ship*, 163 N.C. App. at 323, 593 S.E.2d at 130 (finding that PIC had put forth "general allegations, but no specific scientific evidence to support those allegations").

51. *See id.* (stating that the court's research did not reveal "any cases involving the application of trade secrets law to animals").

52. *Id.* at 324, 593 S.E.2d at 131.

Carolina cases construing the Act have made clear that a trade secret will not be found when there is a lack of specificity regarding what constitutes the trade secret. Since trade secrets involve swift injunctive relief, a moving party must articulate his reasons with sufficient particularity such that a court may determine what information has been misappropriated.⁵³ In the instant case, the court of appeals claimed that PIC's allegations concerning its biological research and selective breeding were too general, and that this absence of specific details left the court unsure about the precise information or process that PIC sought to protect under the Act.⁵⁴

PIC's was not the first case to fail on specificity grounds. Many other trade secrets claims have suffered similar fates.⁵⁵ And yet a closer review of the *North Carolina Farm Partnership* opinion suggests that the problem may have been more than just a lack of particularity on PIC's part. Indeed, the Warren County trial court never properly grasped what aspect of PIC's research was being claimed for trade secret eligibility. The court of appeals was likely misled by the erroneous analysis of the lower court.

For example, in denying PIC's trade secrets claim, the trial court concluded that while PIC's breeding processes were valuable intellectual property, "this fact does not make a pig[] a trade secret."⁵⁶

53. *FMC Corp. v. Cyprus Foote Mineral Co.*, 899 F. Supp. 1477, 1484 (W.D.N.C. 1995) (denying an injunction where the moving party failed to present "evidence of specific trade secrets and processes"); *Analog Devices, Inc. v. Michalski*, 157 N.C. App. 462, 469, 579 S.E.2d 449, 454 (2003) ("We will not read into [plaintiff's] claims specific identification of devices worthy of trade secret protection when it is [plaintiff's] burden to come forward with evidence of such devices.").

54. *N.C. Farm P'ship*, 163 N.C. App. at 323-24, 593 S.E.2d at 130-31.

55. See, e.g., *Del Monte Fresh Produce Co. v. Dole Food Co.*, 136 F. Supp. 2d 1271, 1293 (S.D. Fla. 2001) (dismissing trade secrets claim without prejudice because plaintiff failed to plead with adequate specificity which aspect of its enhanced pineapple it sought to protect); *FMC Corp.*, 899 F. Supp. at 1484 (declining trade secret protection in the absence of any "evidence of specific trade secrets and processes"); *Analog Devices*, 157 N.C. App. at 472, 579 S.E.2d at 455 (rejecting a trade secrets claim because plaintiff did not present "specific devices, combinations, or processes that would merit trade secret protection"); *S.E.T.A. UNC-CH, Inc. v. Huffines*, 101 N.C. App. 292, 296-97, 399 S.E.2d 340, 343 (1991) (finding that a "general description" of the justification for defendant researcher's animal experiments was not worthy of trade secrets protection).

56. *N.C. Farm P'ship v. Pig Improvement Co.*, No. 01-CVS-15 (N.C. Super. Ct. Aug. 29, 2002) (order denying injunctive relief). NCF made a similarly misplaced argument to the court of appeals, stating that PIC's trade secrets claim was invalid because it did not involve any information, but a "living animal." See *Plaintiffs Appellees' Brief* at 25, *N.C. Farm P'ship v. Pig Improvement Co.*, 163 N.C. App. 318, 593 S.E.2d 126 (2004) (No. COA03-328). In contrast, PIC had consistently maintained from the outset of the case that its alleged trade secret was not in a living animal, but in the "confidential and unique genetic material" contained therein, which it characterized as "protected intellectual property." See *Defendant Pig Improvement Co.'s Mot. for Temp. Inj.* at 9, *N.C. Farm*

In framing PIC's case that way, the trial court fundamentally misconstrued that which was worthy of trade secrets protection. PIC was not arguing that it owned a trade secret in a mere pig, but rather that its trade secret was in the "genetics incorporated into [PIC's] breeding animals."⁵⁷ PIC sought to protect the actual genetic information in the cells of the pig—produced via years of selective breeding—as it is the genetic information that ultimately determines the pig's superior physical characteristics. In other words, the company did not argue for trade secret protection for the pig itself, nor for the breeding process, but for the proprietary genetic messages encoded within the cells of the pig.⁵⁸ This key distinction was lost on the trial court,⁵⁹ and it may have influenced the outcome of the case on appeal.

Indeed, the court of appeals' observation that there existed no case law "involving the application of trade secrets law to animals"⁶⁰ evinces this fundamental mischaracterization of PIC's claim. PIC was seeking to claim a trade secret in the genetic codes within that animal, not the living animal itself. Put another way, the court of appeals used the naked eye in evaluating PIC's trade secrets claim when it should have used a microscope. The court's misformulation may have been due in part to PIC's lack of specificity, but it also had its roots in the lower court's initial failure to grasp that which PIC was seeking to protect.

Another reason the *North Carolina Farm Partnership* court refused to recognize a trade secret in the genes within PIC's pigs may

P'ship v. Pig Improvement Co., Inc. (N.C. Super. Ct. Apr. 12, 2002) (No. 01-CVS-15); Defendant-Appellant's Brief at 19, *N.C. Farm P'ship* (No. COA03-328) (arguing that "[t]he information at issue in this case is genetic information embodied in the pigs' DNA").

57. *N.C. Farm P'ship*, 163 N.C. App. at 319, 593 S.E.2d at 128 (alteration in original).

58. Defendant-Appellant's Brief at 19, *N.C. Farm P'ship* (No. COA03-328) ("[T]he information at issue in this case is genetic information embodied in the pigs' DNA."). For an analogous claim, see *Del Monte*, 136 F. Supp. 2d at 1291. In that case, the plaintiff invoked Florida's trade secrets statute in order to protect its interest in a variety of pineapple it had scientifically developed, which purportedly contained "a higher vitamin C content, a sweeter taste, more fiber, brighter color, a more pleasant smell, and a milder texture." *Id.* at 1275. The defendant argued in response that the plaintiff could not claim a trade secret in a pineapple, because a pineapple was not "information." *Id.* at 1291. The district court summarily rejected this argument, stating that plaintiff did not "seek to protect any pineapple as a trade secret. Rather, [plaintiff] seeks to protect its proprietary interest in the MD-2 variety of pineapple." *Id.* (emphasis added).

59. See *N.C. Farm P'ship v. Pig Improvement Co.*, No. 01-CVS-15 (N.C. Super. Ct. Aug. 29, 2002) (order denying injunctive relief) ("[T]he court is far from convinced that pigs themselves are trade secrets.").

60. *N.C. Farm P'ship*, 163 N.C. App. at 323, 593 S.E.2d at 130.

have been because of its concerns about extending the Act, absent clear language indicating that genetically-enhanced organisms were worthy of protection. While the court's concerns—if any—about judicial law-making are valid, they are misplaced, for the language of the Act is already expansive enough to encompass genetic messages. By recognizing a trade secret in PIC's genetic material, the court would not have been extending the Act. Rather, it would have simply been giving life to the intent of the North Carolina General Assembly in drafting a broadly-worded, inclusive statutory scheme of intellectual property protection. A review of the broad language of the Act and its construction by North Carolina courts, as well as a review of analogous trade secrets cases from other jurisdictions, suggest that the outcome in *North Carolina Farm Partnership* should have been different.

The Act defines “trade secret” to mean “business or technical information, including but not limited to a formula, pattern, program, device, compilation of information, method, technique, or process.”⁶¹ The use of the phrase “including but not limited to” in the Act's trade secrets definition makes the Act broader than the Uniform Trade Secrets Act, which lacks such language.⁶² The language of the North Carolina Act is also broader and more inclusive than the *Restatement of Torts*, which defines a trade secret as “a formula for a chemical compound, a process of manufacturing, treating or preserving materials, or a pattern for a machine or other device,” as long as it is used continuously in the operation of a business.⁶³ If such information has commercial value because it is not readily ascertainable, and if such information is reasonably secretive, it will be protected from misappropriation under the North Carolina Act.⁶⁴

In light of this broad definition, it is not immediately clear why the genetic lines embodied in a living organism could not be considered a trade secret. PIC's genetic messages could properly be construed as either “formulae” or “compilations of information” under the language of Act.⁶⁵ With respect to the “formulae”

61. N.C. GEN. STAT. § 66-152(3) (2003).

62. See UNIF. TRADE SECRETS ACT § 1(4), 14 U.L.A. 438 (1990) (stating that a trade secret “means information, including a formula, pattern, compilation, program, device, method, technique or process,” without stating that the definition may also extend beyond those explicit categories). See also Hathaway, *supra* note 41, at 2158 (comparing the North Carolina Trade Secrets Protection Act with the Uniform Trade Secrets Act).

63. See RESTATEMENT (FIRST) OF TORTS § 757, cmt. b (2004).

64. N.C. GEN. STAT. § 66-152(3).

65. The other categories of the Act, such as “methods,” “techniques,” “patterns,” and “processes,” typically pertain to methods of operation, such as manufacturing methods.

category, North Carolina courts have held that this includes recipes and chemical compounds, such as silvering solutions used to make mirrors.⁶⁶ Assuming it is the synthesizing of various divergent components into a single proprietary compound that connotes a formula, genetic codes could likewise be construed as formulae. While PIC does not own a secret formula for its pig, it does merge together various genetic traits during its selective, proprietary breeding process. According to the company, favorable genetic lines are combined from various pig strains—among them Large White pigs, Landrace pigs, Duroc pigs, and Meishan pigs—all with the goal of obtaining a “compound” pig with all of PIC’s advantageous genetic traits.⁶⁷ This consolidation of genetic traits in a single animal is analogous to a recipe or a chemical compound, even if it is somewhat more abstract than a traditional “formula.”

Moreover, PIC’s genetic messages could be construed as “compilations of information” under the language of the Act. Although North Carolina courts have typically construed the “compilations of information” category as referring to confidential documents that compile data, such as company price lists⁶⁸ and feasibility studies,⁶⁹ a genetic code could nevertheless be construed as a compilation of information. Over the course of its selective breeding process, PIC compiles all of the favorable genetic traits that it has selected into a single pig’s stock. In that sense, PIC’s selectively bred pigs are analogous to a customer list that compiles valuable data, even if the pigs’ DNA is not as tangible as a business document.

Assuming the phrases “formulae” or “compilations of information” include the genetic codes in PIC’s pigs, it seems clear that the codes—which caused the pigs to be physically larger and

While PIC perhaps could have argued that its methods of selective breeding constituted a “method,” “technique,” “pattern,” or “process,” its decision to claim “the genetic information in the pigs’ DNA” made it more likely that its genetic codes would be construed as a “formula” or a “compilation of information.” See Defendant-Appellant’s Brief at 19, *N.C. Farm P’ship* (No. COA03-328).

66. See *Potter v. Hileman Labs., Inc.*, 150 N.C. App. 326, 331, 564 S.E.2d 259, 263 (2002).

67. See PIC Int’l Group, Products, at <http://www.pic.com/products> (last visited Aug. 25, 2005) (on file with the North Carolina Law Review).

68. See *Wilmington Star-News, Inc. v. New Hanover Reg’l Med. Ctr.*, 125 N.C. App. 174, 179–82, 480 S.E.2d 53, 55–57 (1997), *appeal dismissed*, 346 N.C. 557, 488 S.E.2d 826 (1997).

69. See *N.C. Elec. Membership Corp. v. N.C. Dept. of Econ. & Cmty. Dev.*, 108 N.C. App. 711, 718, 425 S.E.2d 440, 444 (1993) (finding that documents containing valuable business information such as sales projections and forecasting methodologies are likely to contain trade secrets).

leaner—would constitute information with a commercial value because they are not generally known or readily ascertainable.⁷⁰ PIC's genetic codes were the subject of secrecy, they were not generally known, nor were they capable of being easily reproduced. NCF conceded as much, providing an affidavit from an expert that stated that PIC's competitors would not be able to work backwards to determine the genetic messages within PIC's pigs "without first performing years of tests."⁷¹ Thus, assuming such confidential genetic codes were viewed as "formulae" or "compilations of information" under the language of the Act, they would clearly be entitled to trade secrets protection were they to be wrongfully misappropriated by a competitor. It is difficult to reconcile the inclusive language of the Act with the court's narrow construction of the Act in *North Carolina Farm Partnership*.

And yet an argument in favor of recognizing genetic codes as trade secrets need not be based solely on the broad language of the Act. North Carolina courts that have construed the definition of a trade secret under the Act have historically taken a more inclusive approach, focusing less on the set categories of section 152, and more on the inherent value of the information and the level of secrecy surrounding it.⁷² One court seemed to minimize the import of the

70. See N.C. GEN. STAT. § 66-152(3) (2003) (requiring that a trade secret derive "independent actual or potential commercial value from not being generally known or readily ascertainable").

71. N.C. Farm P'ship v. Pig Improvement Co., 163 N.C. App. 318, 324, 593 S.E.2d 126, 130-31, *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004). See also 1 MILGRIM ON TRADE SECRETS § 1.07 (2005) ("[A] matter cannot be considered a trade secret if it is well known or readily ascertainable."); Peter J. Courture, *Independent Derivation and Reverse Engineering*, in PRACTISING LAW INSTITUTE, TRADE SECRET PROTECTION AND LITIGATION: PROTECTING CONFIDENTIAL BUSINESS AND TECHNICAL INFORMATION 623 (1992) ("The more difficult, time consuming, and costly it would be to develop the information, the less likely it is 'readily' ascertainable.").

72. See, e.g., *Static Control Components, Inc. v. Darkprint Imaging, Inc.*, 200 F. Supp. 2d 541, 544-45 (M.D.N.C. 2002) (finding that customer and vendor lists are adequately defined as trade secrets under the Act, without tying those categories of information directly to the definitions of section 152); *Barr-Mullin, Inc. v. Browning*, 108 N.C. App. 590, 594-96, 424 S.E.2d 226, 228-30 (1993) (analyzing whether a computer program is a trade secret by inquiring into the secrecy surrounding it, rather than asking under which particular category of section 152 the computer program would fall). North Carolina law is not unique in focusing primarily on the commercial value of the information and the level of secrecy surrounding that information rather than on set statutory definitions. See, e.g., *Lehman v. Dow Jones & Co.*, 783 F.2d 285, 298 (2d Cir. 1986) (noting that the key consideration in analyzing a trade secret claim is whether the information is secret). Other jurisdictions have gone further than this. Rather than parsing the language of a trade secrets statute, for example, some courts have allowed for the legal protection of confidential, proprietary information even if it does not rise to the level of a trade secret. See, e.g., *Roboserve, Ltd. v. Tom's Foods, Inc.*, 940 F.2d 1441, 1456 (11th Cir. 1991)

definitional categories of section 152, broadly defining a trade secret as including any “sufficiently suggestive research data that would give a person skilled in the art a competitive advantage he might not otherwise enjoy but for the knowledge gleaned from the owner’s research investment.”⁷³

The six-factor test articulated in *Wilmington Star-News*⁷⁴ is a perfect example of this inclusive approach to defining a trade secret. In that case, the court focused less on what particular category of the Act a company’s price list fell under, and more on the totality of the circumstances, including the commercial benefits the list would bestow, as well as the efforts taken to guard the list’s secrecy.⁷⁵ Had the court of appeals relied on the *Wilmington Star-News* approach in evaluating PIC’s claim, the court would have concluded that genetic codes fall under the protections of the Act.⁷⁶ The genetic traits of PIC’s pigs were not generally known outside of its business, but were well-known by the scientists who conducted the selective breeding process within the business; the enhanced breeding pigs were carefully guarded⁷⁷ by PIC to prevent any misappropriation; the genes of the enhanced pigs, with their leaner tissue masses and their increased growth rates, were clearly of value to the company; the amount of money PIC had expended in research and development was substantial; and PIC’s genetic information could not be easily

(stating that an item may be protected as confidential information without rising to the level of a trade secret); *Lamorte Burns & Co. v. Walters*, 770 A.2d 1158, 1167 (N.J. 2001) (stating that whether information is a trade secret should not end a court’s analysis, because information may still be “legally protectable as confidential and proprietary information” even if it is not a trade secret).

73. *Glaxo Inc. v. Novopharm Ltd.*, 931 F. Supp. 1280, 1299 (E.D.N.C. 1996) (applying North Carolina trade secrets law), *aff’d*, 110 F.3d 1562 (Fed. Cir. 1997).

74. 125 N.C. App. 174, 480 S.E.2d 53 (1997), *appeal dismissed*, 346 N.C. 557, 488 S.E.2d 826 (1997); *see supra* text accompanying note 39.

75. *Id.* at 180–82, 480 S.E.2d at 56–57.

76. The court of appeals gave no reason as to why the *Wilmington Star-News* test was not applied in *North Carolina Farm Partnership*. In fact, the court did not even mention *Wilmington Star-News*. This absence was somewhat puzzling, as the case’s six-factor test has been applied in numerous other North Carolina trade secrets cases. *See cases cited supra* note 40. It seems at least arguable that the court opted not to apply the test because doing so would have mandated a different result.

77. The Multiplier Agreement between the parties contained an express provision obligating NCF to refrain from disclosing “PIC breeding techniques, feeding programs, or other information furnished by PIC in connection with the development and maintenance of the multiplier herd.” *N.C. Farm P’ship v. Pig Improvement Co.*, No. 01-CVS-15 (N.C. Super. Ct. Aug. 29, 2002) (order denying injunctive relief). The Agreement also prohibited NCF from “selling or using pigs for breeding purposes” without the consent of PIC. *Id.*

duplicated or readily ascertained.⁷⁸ In other words, the recognition of genetically-modified living organisms as trade secrets is not only mandated by the broad language of the Act, but also by North Carolina courts' historically inclusive construction of the proper definition of a "trade secret."

In addition, analogous cases from other jurisdictions suggest that trade secrets protection of a company's proprietary genetic strains is entirely warranted. For example, in *Rhone-Poulenc Agro, S.A. v. DeKalb Genetics Corp.*,⁷⁹ a corporation claimed a trade secret in a type of genetically-engineered corn that was herbicide resistant.⁸⁰ The company, Rhone-Poulenc Agro ("RPA"), had created a genetic construct called RD-125 by combining a peptide with a maize gene that had been mutated.⁸¹ RPA licensed this gene to the defendant, DeKalb.⁸² When DeKalb licensed the corn line to a third party, RPA sued, alleging misappropriation of a trade secret.⁸³ The jury, applying North Carolina law, concluded that the genetic construct within the corn was a trade secret.⁸⁴ The Federal Circuit affirmed the jury's finding.⁸⁵

Similarly, in *Pioneer Hi-Bred International v. Holden Foundation Seeds, Inc.*,⁸⁶ the plaintiff claimed a trade secret in a type of hybrid corn seed it had genetically engineered, H3H, which apparently

78. As noted above, NCF seemed to concede that PIC's genetic messages were not readily ascertainable. See *supra* text accompanying note 71. The company provided the affidavit of a professor of animal science and genetics who stated that it would be impossible for PIC's competitors to "work backwards to figure out what [PIC] did to develop [a] pig." *N.C. Farm P'ship v. Pig Improvement Co.*, 163 N.C. App. 318, 324, 593 S.E.2d 126, 130–31, *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004). This was a somewhat unusual argument for NCF to be making, since information is typically more likely to be a trade secret if it is not readily ascertainable through reverse engineering. See N.C. GEN. STAT. § 66-152(3)(a) (2003) (defining one of the characteristics of trade secrets as not being "readily ascertainable through . . . reverse engineering"). NCF's argument was a strategic one. The company seemed to be suggesting that the genetics within PIC's pigs were wholly incapable of being ascertained or duplicated by anyone, and that therefore it was impossible for NCF or anyone else to "misappropriate" such information. See Defendant-Appellant's Brief at 23–33, *N.C. Farm P'ship* (No. COA03-328). In other words, NCF asserted that there was no actual information for PIC to protect, because it was not readily ascertainable by any party—PIC included.

79. 272 F.3d 1335 (Fed. Cir. 2001), *vacated on other grounds*, 538 U.S. 974 (2003).

80. *Id.* at 1340.

81. *Id.*

82. *Id.* at 1340–41.

83. *Id.* at 1342–43.

84. *Id.* at ¶ 1343, 1358.

85. *Id.* at 1359–60.

86. 35 F.3d 1226 (8th Cir. 1994).

possessed superior qualities.⁸⁷ Unlike NCF, the allegedly-infringing defendant in *Pioneer* did not dispute the characterization of genetic messages in corn as trade secrets.⁸⁸ Rather, the defendant conceded from the outset that a company could claim a proprietary interest in parent gene lines.⁸⁹ Thus the Court of Appeals for the Eighth Circuit, applying Iowa trade secrets law,⁹⁰ presupposed in its analysis that genetic codes could qualify for trade secret status.⁹¹

Although both *Rhone-Poulenc* and *Pioneer* involve genetic constructs in corn rather than a living animal, these cases speak more generally to the idea that genetic codes—if they are sufficiently secret, commercially valuable, and difficult to ascertain—may be entitled to trade secret protection. Such a concept is directly analogous to a genetically-enhanced organism, such as a pig. These two cases, as well as the broad language of the Act and its traditionally inclusive construction by North Carolina courts, suggest that *North Carolina Farm Partnership* should have been decided differently.

One approach that might have led the Court of Appeals of North Carolina to a different outcome in *North Carolina Farm Partnership* would have been to heed a more policy-driven approach, such as the one taken by the United States Supreme Court in *Diamond v. Chakrabarty*.⁹² In that case, the Court held that genetically-modified living organisms were patentable subject matter⁹³ under the language of the federal Patent Act.⁹⁴ The Supreme Court's interpretation of patent protection in light of the inclusive language of the Patent

87. *Id.* at 1228.

88. *Id.* at 1235.

89. *Id.*

90. Iowa, whose trade secrets statute uses almost the exact same language as the North Carolina act, has taken an extremely inclusive approach to trade secrets. Its courts have found that the scope of the phrase "trade secrets" includes "virtually any category of information, including recipes for sandwiches, pizza sauce, and crust." See Hathaway, *supra* note 41, at 2169–70. Iowa's expansive approach to trade secrets law in general—and the *Pioneer* court's holding in particular—may be related to Iowa's predominantly agricultural market, where agricultural breeding, cross-pollination, and genetic engineering are undoubtedly more common than in other states. In any event, it seems likely that PIC would have benefited from the expansive approach that Iowa courts take to trade secrets issues. Indeed, the district court in Iowa (where PIC first moved for an injunction) accepted the argument that its genetic material was a trade secret, holding that "unauthorized dissemination of genetic material to [NCF] . . . would adversely affect [PIC's] ability to protect its trade secrets." *PIC USA v. N.C. Farm P'ship*, 672 N.W.2d 718, 721 (Iowa 2003) (emphasis added).

91. *Pioneer*, 35 F.3d at 1235.

92. 447 U.S. 303 (1980).

93. *Id.* at 310.

94. 35 U.S.C. § 101 (2000).

Act⁹⁵—as well its general admonition against hampering innovation in genetic research by denying companies the protection of law⁹⁶—resonate in light of *North Carolina Farm Partnership*. The *Diamond* Court's insights into patent law are helpful in understanding how the Court of Appeals of North Carolina should have construed the North Carolina Trade Secrets Protection Act.

This is not to suggest that patent law and trade secrets law are entirely analogous; there are notable differences between the two. First and foremost, patent law is a creature of federal statute,⁹⁷ whereas trade secrets law is grounded in the statutes of individual states, each with its own definitions and requirements.⁹⁸ Patent law grants the holder of a patent an exclusive right for a limited period as an incentive to risk the costs in research and development; the holder of a patent is granted a right of exclusion in exchange for the inventor's full disclosure of the invention.⁹⁹ Trade secrets law, on the other hand, is concerned with standards of commercial ethics.¹⁰⁰ While disclosure is a requirement of patent law, secrecy is essential to a trade secret; the owner of a trade secret must show that except by the use of improper means there would be difficulty acquiring the information.¹⁰¹ Each body of law has its own distinct emphasis; patent law is focused on promoting an invention's disclosure, while trade secrets law is focused on protecting an invention's secrecy.¹⁰²

95. *Diamond*, 447 U.S. at 308–09.

96. *Id.* at 317.

97. *See* 35 U.S.C. §§ 1–376.

98. For a review of various states' trade secrets laws, see Hathaway, *supra* note 41, at 2155–66.

99. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480–81 (1974).

100. *Id.* at 481.

101. *Id.*

102. *See id.* at 475. *See also* *Pioneer Hi-Bred Int'l v. Holden Found. Seeds, Inc.*, 35 F.3d 1226, 1238 n.42 (8th Cir. 1994) (stating that “[t]rade secret law and patent law . . . serve quite different functions”). The distinct emphases of patent law and trade secrets law—the former on disclosure, the latter on secrecy—signify that a company usually must choose between one or the other in terms of seeking legal protection. As one federal court noted, any time an invention qualifies as a valid trade secret, the inventor will not have disclosed the idea sufficiently to obtain a patent. *Glaxo, Inc. v. Novopharm, Ltd.*, 931 F. Supp. 1280, 1298 (E.D.N.C. 1996), *aff'd*, 110 F.3d 1562 (Fed. Cir. 1997). Conversely, the owner of a valid patent will have been forced to disclose the best method for practicing the invention, effectively destroying any trade secret protection he might have had. *Id.* *See also* *Rhone-Poulenc Agro, S.A. v. DeKalb Genetics Corp.*, 272 F.3d 1335, 1359–60 (Fed. Cir. 2001) (recognizing a company's trade secret, but holding that the period of trade secret protection terminated when a patent was issued and the idea was fully disclosed). Therefore, a company will not usually claim a trade secret and a valid patent simultaneously. Typically a company must choose one or the other form of legal protection, depending on the precise nature of the information it is seeking to protect.

Despite these differences, there are similarities between patent law and trade secrets law. Both patent law and trade secrets law fall under the general rubric of intellectual property law, which is a nebulous, highly elusive concept.¹⁰³ Intellectual property law's essential purpose is to offer legal protection to the products of the human mind. This goal is extremely difficult to accomplish, however, as the human mind is constantly creating new, unforeseen inventions. Neither the Patent Act, nor the North Carolina Trade Secrets Protection Act—nor any other statute protecting intellectual property for that matter—can ever adequately address, via express statutory language, every conceivable human invention that is worthy of protection. This is the main reason why intellectual property statutes like the Patent Act and the North Carolina Trade Secrets Protection Act tend to be so broadly worded.¹⁰⁴ Their broad language reflects a legislative realization¹⁰⁵ that new inventions will continually be created, and that these new inventions are worthy of legal protection, even if they were not foreseen at the time of a statute's drafting. In that sense, the United States Supreme Court's interpretation of the Patent Act in *Diamond* can be influential in interpreting the North Carolina Trade Secrets Protection Act.

Diamond involved a patent application for a genetically-modified bacterium capable of breaking down multiple components of crude oil.¹⁰⁶ The Patent and Trademark Office ("PTO") denied the patent, both because micro-organisms are "products of nature"¹⁰⁷ and

103. See *Pioneer*, 35 F.3d at 1238. Although trade secrets law also incorporates common law contract principles, it is typically treated as a subset of intellectual property law.

104. Indeed, the Patent Act and the North Carolina Trade Secrets Protection Act are not the only intellectual property statutes that employ inclusive, open-ended language. For a case in which the Supreme Court concluded that the Lanham Act, 15 U.S.C.A. §§ 1051–1127 (2004), employed language that was "not restrictive," and that therefore its protections applied to a company seeking a trademark in a color, see *Qualitex Co. v. Jacobson Products Co., Inc.*, 514 U.S. 159, 162 (1995).

105. See, for example, *Diamond v. Chakrabarty*, 447 U.S. 303 (1980), where the Court stated:

The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any improvement thereof" . . . subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language The committee reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to include "anything under the sun that is made by man."

Id. at 309–10 (citations omitted).

106. *Id.* at 305.

107. Interestingly, NCF relied on a similar argument in *North Carolina Farm Partnership*, arguing that "[n]ature created the DNA in the pigs." Plaintiffs Appellees'

because living micro-organisms are not patentable subject matter under the Patent Act.¹⁰⁸ Section 101 of the Patent Act provides patent protection for any “process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.”¹⁰⁹ The PTO found that living things did not fall into any of those categories.¹¹⁰ Therefore, the bacterium was not patentable.¹¹¹ The Supreme Court reversed the PTO’s rejection, holding that a live, human-made micro-organism is patentable subject matter under section 101, as either a “manufacture” or a “composition of matter.”¹¹²

The *Diamond* Court based its holding in large part on the general language of the Patent Act.¹¹³ According to the Court, such terms as “manufacture,” and “composition of matter,” evinced an understanding that the patent laws must be given wide scope.¹¹⁴ The Court found that section 101 contained broad language, and therefore the Court was willing to recognize living organisms as protected matter under the Act.¹¹⁵ The *Diamond* opinion also explained that the Patent Act employed general language because many scientific inventions are unforeseeable at the time of a statute’s drafting.¹¹⁶

The Court was also not persuaded by the PTO’s finding that the bacterium was a product of nature and therefore not patentable. The

Brief at 23, *N.C. Farm P’ship v. Pig Improvement Co.*, 163 N.C. App. 318, 593 S.E.2d 126 (No. COA03-328).

108. *Diamond*, 447 U.S. at 306.

109. 35 U.S.C. § 101 (2000).

110. *Diamond*, 447 U.S. at 306.

111. *Id.*

112. *Id.* at 307–10. See also Kevin W. O’Connor, *Patenting Animals and Other Living Things*, 65 S. CAL. L. REV. 597, 602–03 (1991) (reviewing the Court’s holding in *Diamond*). For a discussion of the ripple effects of the Court’s holding in *Diamond*, including the PTO’s eventual decision in 1987 to recognize non-naturally occurring multicellular living organisms as patentable subject matter under 35 U.S.C. § 101, see James P. Daniel, *Of Mice and “Manimal”*: *The Patent and Trademark Office’s Latest Stance Against Patent Protection for Human-Based Inventions*, 7 J. INTELL. PROP. L. 99, 108–18 (1999); Stephen G. Whiteside, *Patents Claiming Genetically Engineered Inventions: A Few Thoughts on Obtaining Broad Property Rights*, 30 NEW ENG. L. REV. 1019, 1025–28 (1996). In the years following *Diamond*, the patent community has continued to struggle over how far to extend patent protection in living organisms, DNA and other genetic material. See generally O’Connor, *supra* (discussing the import of *Diamond* and the ongoing concerns raised by patenting living organisms). While the ongoing debate in the patent community may have been part of the reason for the Court of Appeals of North Carolina’s hesitation to extend trade secrets protection to this field, no such concern is mentioned in the *North Carolina Farm Partnership* opinion.

113. *Diamond*, 447 U.S. at 315.

114. *Id.* at 308.

115. *Id.* at 310.

116. *Id.* at 316.

Court plainly rejected this argument, concluding that the bacterium was not in any way naturally-occurring. The Court instead pointed out that the bacterium possessed markedly different characteristics from bacteria found in nature, and that therefore it was clearly a product of human ingenuity.¹¹⁷

In reviewing the Court's reasoning in *Diamond*, a few points should be noted. First, the Court's broad interpretation of the Patent Act stands in striking contrast to the Court of Appeals of North Carolina's cursory review of the language of the North Carolina Trade Secrets Protection Act in *North Carolina Farm Partnership*—this, despite the fact that both statutes are broadly worded so as to encompass a wide range of intellectual property interests. If the Supreme Court identified such terms as “manufacture” or “composition of matter” as expansive terms, such that they included living organisms, it is not immediately apparent why the trade secrets act—with terminology such as “compilation of information,” “formula,” “technique,” and “process”—would not possess similarly wide breadth. On the face of the language of the two Acts, it is not clear why the outcomes of the two cases should be so divergent.¹¹⁸

Second, the *Diamond* Court was clearly more aware of the greater public interest in promoting scientific research and development through an inclusive construction of the patent laws. The Court refused to give credence to the idea that unanticipated inventions should be denied legal protection. On the contrary, the Court observed that “the inventions most benefiting mankind are those that push back the frontiers of chemistry, physics, and the like.”¹¹⁹ The Court also warned against any judicial attempts to hamper scientific development by narrowly construing intellectual property laws.¹²⁰ In light of a clear choice between whether research efforts would be incentivized via legal protection, or stifled due to a lack of legal protection,¹²¹ the *Diamond* Court erred in favor of

117. *Id.* at 310.

118. While perhaps the outcome hinged on the particular legislative history of the Patent Act, as well as the distinct purpose of the patent laws to “promote the progress of science and useful arts,” it can be argued that both acts share the goal of protecting products of human ingenuity, and that both acts purport to do so by using broad and expansive statutory language. In light of those shared aims, it is not immediately clear why one statute should be much more narrowly construed than the other.

119. *Diamond*, 447 U.S. at 316 (quoting *Great A. & P. Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 154 (1950)).

120. *See, e.g., id.* at 317 (stating that “judicial fiat as to patentability will not deter the scientific mind from probing into the unknown”).

121. *Id.*

encouraging scientific research by interpreting the Patent Act to be broad and non-restrictive.

To be sure, the *Diamond* case is not entirely analogous to *North Carolina Farm Partnership*. The bacterium in *Diamond* was created through the introduction of new genetic material into a living organism,¹²² a process that is much more sophisticated than PIC's selective pig breeding. Whereas the bacterium in *Diamond* was created by microscopically integrating DNA strains, PIC's process was somewhat cruder, as it involved strategically breeding swine in order to produce a higher occurrence of preferred genetic traits in certain offspring.¹²³ Moreover, the plaintiff in *Diamond* sought a patent, which offers a much higher standard of legal protection than trade secrets law. Unlike the plaintiff in *Diamond*, PIC did not have, nor did it ever apparently seek, a patent for its genetically-modified swine; the company instead attempted to invoke the different type of protection afforded under trade secrets law. Despite these differences, the *Diamond* opinion still stands for the general proposition that the genetics in living organisms may embody valuable information meriting the protection of law.¹²⁴

Moreover, PIC's failure to obtain a patent in *North Carolina Farm Partnership* does not necessarily mean that it should be barred from any level of intellectual property protection. Despite the fact that they offer less protection than patents, trade secrets still have an important "part to play in the technological and scientific advancement of the [n]ation."¹²⁵ The Supreme Court has noted that trade secrets law may provide useful legal protections for works that are "doubtfully patentable and clearly unpatentable."¹²⁶ It is likely that PIC's genetic codes were just such information—secretive, proprietary, and highly valuable, but not sophisticated enough to be patentable. Trade secrets law and patent law each have a particular

122. See Daniel, *supra* note 112, at 108.

123. Michael E. Sellers, *Patenting Nonnaturally Occurring, Man-made Life: A Practical Look at the Economic, Environmental, and Ethical Challenges Facing Animal Patents*, 47 ARK. L. REV. 269, 270-71 (1994) (stating that selective breeding is much more unpredictable and much less precise than hybridization and DNA insertion).

124. See, e.g., Michael J. Malinowski & Maureen O'Rourke, *A False Start? The Impact of Federal Policy on the Genotechnology Industry*, 13 YALE J. ON REG. 163, 229 (1996) (stating that since *Diamond*, "it has been settled law that, while naturally occurring phenomena are not patentable, genetically-engineered living organisms may fall within the Patent Act's statutory subject matter").

125. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 493 (1974).

126. *Id.* at 491. See also Root & Blynn, *supra* note 29, at 827 ("Trade secrecy offers advantages over the patent system, particularly in situations in which the devices or processes to be protected are of doubtful patentability.").

role to play in the overall scheme of intellectual property protection, and “the operation of one does not take away from the need for the other.”¹²⁷ In fact, one commentator has described trade secrets law as an efficient alternative to patent protection for companies, and has noted in particular that a trade secret in a genetically-modified animal might be a practical alternative to a patent where the animal has a high intrinsic value and is somewhat limited in number.¹²⁸ In other words, the *Diamond* analogy to *North Carolina Farm Partnership* does not fall short merely because one case involved patent law and the other trade secrets law.

Most significantly, *Diamond* exemplifies an inclusive approach to interpreting the language of intellectual property statutes in general, and the Patent Act in particular, and it demonstrates a keen awareness of the effect such an approach would have on research and development. Had the Court of Appeals of North Carolina followed such an inclusive approach in *North Carolina Farm Partnership*, it might have recognized that the North Carolina Trade Secrets Act properly includes genetically-enhanced organisms as trade secrets worthy of protection.

Unfortunately, *North Carolina Farm Partnership* makes no mention of the potential detrimental effects of limiting trade secret protection solely to non-living objects. The opinion is utterly devoid of the public policy concerns so prevalent in *Diamond*. This lack of policy analysis is particularly noteworthy as *North Carolina Farm Partnership* involved genetic enhancement via selective breeding, a research field which is not only financially lucrative, but which also has the potential to convey numerous medical and commercial benefits on the public. It is likely that the court of appeals’ narrow approach to trade secrets could have the long-term effect of stifling progress in the field of genetic research—whether it be the selective breeding in which PIC was engaged, or more advanced forms of biotechnology.

Research involving the genetic engineering of plants and animals has grown steadily in recent years.¹²⁹ With respect to animals, there has been growth in research involving “transgenic animals”—that is, an animal whose DNA has been augmented by adding DNA from another living organism.¹³⁰ While the bulk of the transgenic animal research is carried out by organizations like the National Institutes of

127. *Kewanee Oil Co.*, 416 U.S. at 493.

128. See O’Connor, *supra* note 112, at 612.

129. *Id.* at 608.

130. *Id.*

Health, which conducts such research for biomedical purposes, such research is also thriving in the agricultural fields, with an explosion in transgenic livestock and poultry.¹³¹ The National Science Foundation expects that projects involving transgenic animals will increase in the coming years.¹³² In addition to animals, the market for genetically-enhanced plants has also grown markedly, as evidenced by the herbicide-resistant corn in *Rhone-Poulenc* or the sweeter, vitamin C-enhanced pineapple in *Del Monte*. Although these biotechnology experiments are not entirely analogous to PIC's selective pig breeding, all of the processes do involve the production of genetic material that is somehow favorable or competitively advantageous, and all of them involve sizeable investments of both scientific resources and capital. According to the court's blanket holding in *North Carolina Farm Partnership*, none of these confidential genetic experiments would be protected from misappropriation by a third party competitor. In the absence of a valid patent, any one of these confidential experiments would be fair game. And while one can hope that that the Court of Appeals of North Carolina might later retreat from its blanket ruling if it were faced with a trade secret involving a more technical and sophisticated method of genetic modification—a hope that is arguably nurtured by the court's finding that PIC's case was devoid of "specific scientific evidence"¹³³—its current *North Carolina Farm Partnership* holding nevertheless remains unlimited in its breadth. Based on the language of the court's opinion, "the application of trade secrets law to animals"¹³⁴ is wholly precluded, regardless of the method involved.

To make matters worse, the potential benefits—both commercial and medical—of such genetic enhancement and biotechnological research are substantial. To take one example, the USDA's Agricultural Research Service is currently conducting research on chickens engineered by recombinant DNA, with the goal of developing poultry that will be resistant to the avian leukosis virus.¹³⁵ If eventually successful, such research would benefit not only poultry producers and farmers, but also the greater public.¹³⁶ Such research is

131. *Id.* at 611.

132. *Id.*

133. *N.C. Farm P'ship v. Pig Improvement Co., Inc.*, 163 N.C. App. 318, 323, 593 S.E.2d 126, 130, *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004).

134. *Id.*

135. See O'Connor, *supra* note 112, at 611.

136. See Sellers, *supra* note 123, at 271 ("The application of these new technologies to animals is expected to produce many new results, including increased growth performance, higher disease resistance, and certain reproductive traits which will

one example of the myriad of biotechnology projects that could yield both commercial and health benefits.

In one sense, these projects confirm the *Diamond* Court's original suspicion that courts and legislatures will never fully succeed in deterring the scientific mind from probing into the unknown.¹³⁷ And yet it is not sufficient to blithely claim that these research projects will continue regardless of the level of intellectual property protection that is afforded to them. On the contrary, one of the key purposes of intellectual property law should be to *encourage* scientific research and innovation—to incentivize it—by providing legal protection to both individuals and corporations. The *Diamond* Court clearly recognized the danger that research efforts could be hampered if there were no legal incentives in place, and it responded by recognizing that patent law was broad enough to encompass genetic research.¹³⁸

In contrast, the Court of Appeals of North Carolina's narrow approach to trade secrets law could have the long-term effect of stifling research and development in these areas, especially with respect to those agricultural companies, such as PIC, whose research may not be scientifically advanced enough to warrant full-blown patent protection.¹³⁹ As the United States Supreme Court once stated, one goal of trade secrets law should be to "encourage invention in areas where patent law does not reach," in order to "prompt the independent innovator to proceed with the discovery and exploitation of his invention."¹⁴⁰ By narrowly construing trade secrets law in *North Carolina Farm Partnership*, the Court of Appeals of North Carolina appears to have lost sight of that greater goal. In the wake of the court's holding, a North Carolina company engaged in genetic research must either seek patent protection, or risk its research being plucked from under it, with no recourse against the party taking the information. Trade secrets law will offer it no middle ground of protection. Moreover, the North Carolina court's narrow approach could have a detrimental effect on the economic health of

collectively lower costs to farmers and produce a more beautiful product for the consumer.").

137. *Diamond v. Chakrabarty*, 447 U.S. 303, 317 (1980).

138. *Id.*

139. See, e.g., Root & Blynn, *supra* note 29, at 827 ("Trade secrecy offers advantages over the patent system, particularly in situations in which the devices or processes to be protected are of doubtful patentability.").

140. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 485 (1974).

the state, in the event companies engaged in genetic research opt to do business in a more permissive jurisdiction, such as Iowa.¹⁴¹

Nor will contract law alone adequately protect the companies engaged in such research. For one, drafting a contract to prevent the disclosure of these types of information—such as recombinant DNA strains or the genes within a selectively-bred animal—would be extremely difficult, as the information is microscopic and difficult to define within the parameters of an employment or business contract.¹⁴² Much of this information is also highly dynamic in the sense that these scientific processes involve continued alterations and modifications to existing genetic codes; it would be difficult to determine which genetic strain at a given moment was the one worthy of protecting.¹⁴³ Finally, from a more practical standpoint, many agricultural companies engaged in such genetic-enhancement research may fail to draft adequate confidentiality agreements with their customers, or they may fail to draft any written contract at all.¹⁴⁴ Trade secrets law offers an additional research incentive to these companies that contract law does not provide.¹⁴⁵ Companies involved in genetic enhancement should be encouraged to conduct their research with the knowledge that they will be protected under state trade secrets law, regardless of whether they make efforts to draft a thoroughly-worded contract with their customers.

Moreover, even if a contract were capable of being drafted to prevent the disclosure of this type of information—for example, by using general confidentiality language forbidding the disclosure of a company's proprietary genetic strains—that fact would not diminish the need for additional protection under trade secrets law. Although confidentiality provisions in contracts are one method used to protect confidential proprietary information, they are by no means the sole method.¹⁴⁶ The monetary remedies available to companies under the trade secrets statutes are more substantial than the remedies of

141. See *supra* note 90.

142. See Sellers, *supra* note 123, at 270 (describing selective breeding as “unpredictable”).

143. *Id.* (explaining that the unpredictable nature of selective breeding arises partly because “there is no guarantee that the desired characteristics will surface in the offspring”).

144. See, e.g., *In re Innovative Constr. Sys., Inc.*, 793 F.2d 875, 884–85 (7th Cir. 1986) (considering “the size and nature of the business” in assessing whether a trade secret was kept secret).

145. See MILGRIM, *supra* note 71, § 4.01 (stating that a trade secret may receive protection even in the absence of an express agreement).

146. See *Static Control Components, Inc. v. Darkprint Imaging, Inc.*, 200 F. Supp. 2d 541, 546 (M.D.N.C. 2002).

contract law.¹⁴⁷ Moreover, the North Carolina General Assembly, in adopting the North Carolina Trade Secrets Protection Act, did not intend for a trade secrets claim to be wholly precluded if information were sufficiently protected via a confidentiality provision in a contract. On the contrary, many trade secrets disputes arise even with clear contract terms in place.¹⁴⁸ As the facts of *North Carolina Farm Partnership* so clearly illustrate, a company deserves additional legal protection under the rubric of trade secrets law in the event a written contract between the parties fails to adequately prevent a misappropriation.

One federal appeals court has observed that “[a] trade secret once lost is, of course, lost forever.”¹⁴⁹ Because of the secret nature of a trade secret, once it has been discovered and exploited by a third party, it loses much of its commercial value. In PIC’s case, competitor companies like NCF may now freely use its genetically-modified pigs to breed additional offspring with favorable genetic traits; the company has no protection for its proprietary interest in the original gene lines. One can hope that the Court of Appeals of North Carolina’s narrow approach to trade secrets protection is limited solely to the particulars of PIC’s case. And yet the court’s blanket statement concerning “the application of trade secrets law to animals” suggests otherwise.¹⁵⁰ If indeed the court’s ruling is intended to apply to all who would invoke trade secrets law in the context of any type of genetic research, the court’s holding was in error. In light of the broad language of the North Carolina Trade Secrets Protection Act, in light of analogous cases from other jurisdictions, and in light of the United States Supreme Court’s holding in *Diamond v. Chakrabarty*, the Court of Appeals of North Carolina should have recognized that the Act includes protections for the genetic material located inside selectively-bred living organisms. Its failure to have done so will have long-term detrimental effects on both companies involved in such research, as well as the general public.

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147. See N.C. GEN. STAT. § 66-154 (2003) (allowing an additional recovery of punitive damages in the event a “willful” misappropriation of a trade secret is shown).

148. See, e.g., *Static Control*, 200 F. Supp. 2d at 542–46 (recognizing a trade secrets claim, even though the confidentiality provision in an agreement would have provided a remedy under contract law).

149. *FMC Corp. v. Taiwan Tainan Giant Indus. Co.*, 730 F.2d 61, 63 (2d Cir. 1984).

150. *N.C. Farm P’ship v. Pig Improvement Co., Inc.*, 163 N.C. App 318, 323, 593 S.E.2d 126, 130, *discretionary review denied*, 358 N.C. 544, 599 S.E.2d 401 (2004).