UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Fiscal Year Ended May 31, 2019

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For The Transition Period From _____To _____.

COMMISSION FILE NUMBER 0-17988

NEOGEN CORPORATION

(Exact name of registrant as specified in its charter)

MICHIGAN	**38-2367843**
(State of other jurisdiction of incorporation organization)	***(I.R.S. Employer Identification No.)***

620 Lesher Place
Lansing, Michigan 48912
(Address of principal executive offices, including zip code)

517-372-9200
(Registrant's telephone number, including area code)

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:

Title of each Class	Trading Symbol(s)	Name of each exchange on which registered

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT:
COMMON STOCK, $0.16 par value per share
(Title of Class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by a check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer. See definition of "accelerated filer and large accelerated filer" in Rule 12b-2 of the Exchange Act.

(Check one):

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐
Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

Based on the closing sale price on November 30, 2018 the aggregate market value of the voting stock held by non-affiliates of the registrant was $3,378,030,000. For these purposes, the registrant considers its Directors and executive officers to be its only affiliates.

The number of outstanding shares of the registrant's Common Stock was 52,281,700 on June 30, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Certain portions of the registrant's definitive proxy statement to be prepared pursuant to Regulation 14a and filed in connection with solicitation of proxies for its October 3, 2019 annual meeting of shareholders are incorporated by reference into part III of this Form 10-K.

TABLE OF CONTENTS

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING INFORMATION

Forward-looking statements, within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, are made throughout this Annual Report on Form 10-K, including statements relating to management's expectations regarding new product introductions; the adequacy of our sources for certain components, raw materials and finished products; and our ability to utilize certain inventory. For this purpose, any statements contained herein that are not statements of historical fact may be deemed to be forward-looking statements. Without limiting the foregoing, the words "believes," "anticipates," "plans," "expects," "seeks," "estimates," and similar expressions are intended to identify forward-looking statements. There are a number of important factors that could cause Neogen Corporation's results to differ materially from those indicated by such forward-looking statements, including those detailed in ITEM 1A. RISK FACTORS and also under the captions "Management's Discussion and Analysis of Financial Condition and Results of Operations," "Critical Accounting Policies and Estimates," and "Future Operating Results."

In addition, any forward-looking statements represent management's views only as of the day this Annual Report on Form 10-K was first filed with the Securities and Exchange Commission and should not be relied upon as representing management's views as of any subsequent date. While management may elect to update forward-looking statements at some point in the future, it specifically disclaims any obligation to do so, even if its views change.

PART I

ITEM 1. BUSINESS

Neogen Corporation and subsidiaries (collectively referred to as we, Neogen, or the Company) develop, manufacture and market a diverse line of products dedicated to food and animal safety. Our Food Safety segment consists primarily of diagnostic test kits and complementary products (e.g., culture media) sold to food producers and processors to detect dangerous and/or unintended substances in human food and animal feed, such as foodborne pathogens, spoilage organisms, natural toxins, food allergens, genetic modifications, ruminant by-products, meat speciation, drug residues, pesticide residues and general sanitation concerns. Our diagnostic test kits are generally less expensive, easier to use and provide greater accuracy and speed than conventional diagnostic methods. The majority of the test kits are disposable, single-use, immunoassay and DNA detection products that rely on our proprietary antibodies and RNA and DNA testing methodologies to produce rapid and accurate test results. Our expanding line of food safety products also includes bioluminescence-based diagnostic technology.

Neogen's Animal Safety segment is engaged in the development, manufacture, marketing and distribution of veterinary instruments, pharmaceuticals, vaccines, topicals, diagnostic products, rodenticides, cleaners, disinfectants, insecticides and genomics testing services for the worldwide animal safety market. The majority of these consumable products are marketed through veterinarians, retailers, livestock producers and animal health product distributors. Our USDA-licensed facility in Lansing, Michigan, produces immunostimulant products for horses and dogs, and a unique equine botulism vaccine. Our line of drug detection products is sold worldwide for the detection of abused and therapeutic drugs in animals and animal products, and has expanded into the human forensic market.

Neogen's products are marketed by our sales personnel in the U.S., Canada, Mexico, Central America, the United Kingdom and other parts of Europe, Brazil, China, India and Australia, and by distributors throughout the rest of the world.

Our mission is to be the leading company in the development and marketing of solutions for food and animal safety. To meet this mission, a growth strategy consisting of the following elements has been developed: (i) increasing sales of existing products; (ii) introducing new products and product lines; (iii) expanding international sales; and (iv) acquiring businesses and forming strategic alliances. We have historically been successful at increasing product sales organically, including international growth, and maintain an active acquisition program to identify and capitalize on opportunities to acquire new products and/or businesses.

Neogen Corporation was formed as a Michigan corporation in June 1981 and actual operations began in 1982. Our principal executive offices are located at 620 Lesher Place, Lansing, Michigan 48912-1595 and our telephone number is (517) 372-9200.

Neogen's Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports are available free of charge via our website (www.neogen.com) as soon as reasonably practicable after such information is filed with, or furnished to, the United States Securities and Exchange Commission. The content of our website or the website of any third party that may be noted herein is not incorporated by reference in this form 10-K.

PRODUCTS

Product trademarks and registered trademarks owned by Neogen include: **CORPORATE:** Neogen®, Neogen flask logo®; **FOOD SAFETY**: AccuClean®, AccuPoint®, AccuScan®, Acumedia®, Agri-Screen®, Alert®, ANSR® , BetaStar®, BioLumix® , Colitag™, F.A.S.T.®, GeneQuence®, GENE-TRAK®, Harlequin®, ISO-GRID®, Lab M®, *Listeria* Right Now™, MPNplate™, NeoCare™, NeoColumn™, NeoFilm®, NeoNet®, NeoSeek™, NEO-GRID®, Penzyme®, Raptor®, Reveal®, Soleris®, µPREP®, Veratox®, Simple. Accurate. Supported. Food Safety Solutions℠; **LIFE SCIENCES**: Alert®, K-Blue®, K-Blue Substrate®, K-Gold®, NeoSal®; **ANIMAL SAFETY**: Acid-A-Foam™, Aero-ssault™, Ag-Tek®, AluShield™, AquaPrime®, Assault®, Barnstorm® , BioCres™ 50, BioPhene™, BioQuat™, BotVax®, Breeder-Sleeve®, Calf Eze™, Chem-Tech, Ltd.™, Chem-Tech's CT logo (with circle)™, Chlor-A-Foam™, COMPANION™, Cowboy Syringe®, CT-511®, Cykill™, D3™ Needles, DC&R®, DeciMax®, Di-Kill®, Dr. Frank's®, Dy-Fly®, Dyne-O-Might®, Earth City Resources (design)®, ElectroJac®, ELISA Technologies (design)®, EqStim®, EquiSleeve®, E-Z Bond™, E-Z Catch®, Farm-Foam™, Farmphene®, Final-Fly-T®, Fly-Die Defense™, Fly-Die Ultra™, Fura-Zone®, GenQuat™, Horse Sense®, Ideal®, ImmunoRegulin®, Insectrin®, Insight™, Iodis®, Jolt®, LD-44®, LD-44T™, Maxi Sleeve®, MaxKlor®, MegaShot™, MycAseptic™ , NeedleGard™, Neogen® Viroxide Super™, Neogen® Viroxide Super™ (design), NFZ™, Nu Dyne®, PanaKare™, Pantek™ , ParlorMint™, Parvosol®, Peraside™, Place Pack®, PolyPetite™, PolyShield™, PolySleeve®, Preserve®, Preserve International®, Preserve International(design)®, Prima®, Prima Marc™, Prima-Shot™, Prima Tech®, Prima Tech logo®, Pro-Fix®, Pro-Flex®, Promar™, Pro-Shot™, PRO-TECT 6 MIL®, PRO-TECT 6 MIL logo®, Prozap®, Prozap (stylized mark w/fancy Z)™, PY-75™, Ramik®, Rat & Mouse-A-Rest II®, RenaKare™, Rodent Elimination Station™, Rodex™, Rot-Not™, Safe-T-Flex™, Siloxycide®, Spectrasol™, Spec-Tuss™, Squire®, Starlicide®, Stress-Dex®, SureBond®, SureKill®, Swine-O-Dyne® , Synergize®, SyrVet®, Tetrabase®, Tetracid®, Tetradyne®, ThyroKare™, TopHoof™, Tri-Hist®, Tri-Seal™, Tryad®, Turbocide®, Turbocide Gold®, Uniprim®, UriKare™, VAP-5™, VAP-20™, Vet-Tie™, Vita-15™, War Paint®, X-185™, Zipcide®; **GENOMICS**: Deoxi™, GeneSeek®, Genomic Profiler™, Genomic Solutions for Food Security®, Igenity®, SeekGain™, SeekSire™, SeekTrace™, Tru-Polled®; **LOGOTYPES:** BioSentry barn logo®, BioSentry chicken logo®, BioSentry pig logo®, Circular design®, TurboCide® (stylized).

Neogen operates in two business areas: the Food Safety and the Animal Safety segments. See Notes to Consolidated Financial Statements elsewhere in this Form 10-K for financial information about our business segments and international operations.

FOOD SAFETY SEGMENT

Neogen's Food Safety segment is primarily engaged in the production and marketing of diagnostic test kits and complementary products marketed to food and feed producers and processors to detect dangerous and/or unintended substances in food and animal feed, such as foodborne pathogens, spoilage organisms, natural toxins, food allergens, genetic modifications, ruminant by-products, meat speciation, drug residues, pesticide residues and general sanitation concerns.

Our test kits are used to detect potential hazards in food and animal feed by testers ranging from small local grain elevators to the largest, best-known food and feed processors in the world, and numerous regulatory agencies. Neogen's products include tests for:

Mycotoxins. Grain producers and processors of all types and sizes use our Veratox, Agri-Screen, Reveal, Reveal Q+ and Reveal Q+ MAX tests to detect the presence of mycotoxins, including aflatoxin, deoxynivalenol, fumonisin, ochratoxin, zearalenone and T-2/HT-2 toxin, to help ensure product safety and quality in food and animal feed.

Food allergens. The world's largest producers of cookies, crackers, candy, ice cream and many other processed foods use our Veratox, Alert, Reveal, Reveal 3-D and BioKits testing products for food allergens to help protect their food-allergic customers from the inadvertent contamination of products with food allergens, such as peanut, milk, egg, almond, gliadin (gluten), soy, hazelnut and coconut residues.

Dairy antibiotics. Dairy processors are the primary users of Neogen's BetaStar S, BetaStar Advanced and BetaStar 4D diagnostic tests to detect the presence of veterinary antibiotics in milk. The presence of these drugs in milk is a public health hazard and an economic risk to producers as it limits the milk's further processing.

Foodborne pathogens. Meat and poultry processors, seafood processors, fruit and vegetable producers and many other market segments are the primary users of Neogen's ANSR and Reveal tests for foodborne bacteria, including *E. coli* O157:H7, *Salmonella*, *Listeria* and *Campylobacter*. Neogen's ANSR pathogen detection system is an isothermal amplification reaction test method which exponentially amplifies the DNA of any bacteria present in food and environmental samples to detectable levels in 10 minutes. Combined with ANSR's single enrichment step, Neogen's pathogen detection method provides DNA-definitive results in a fraction of the time of other molecular detection methods. Our *Listeria* Right Now test detects the pathogen in less than 60 minutes without sample enrichment. Reveal's lateral flow device combines an immunoassay with chromatography for a rapid and accurate one-step result.

Spoilage microorganisms. Neogen's Soleris and BioLumix products are used by food processors to identify the presence of spoilage organisms (e.g., yeast and mold) and other microbiological contamination in food. The systems measure microbial growth by monitoring biochemical reactions that generate a color change in the media as microorganisms grow. The sensitivity of the system allows detection in a fraction of the time needed for traditional methods, with less labor and handling time. Our NeoSeek genomics services utilize a novel application of 16s metagenomics to determine all bacteria in a sample, without introducing biases from culture media, and without the need to generate a bacterial isolate for each possible microbe in a sample.

Sanitation monitoring. Neogen manufactures and markets our AccuPoint Advanced rapid sanitation test to detect the presence of adenosine triphosphate (ATP), a chemical found in all living cells. This easy-to-use and inexpensive test uses bioluminescence to quickly determine if a contact surface has been completely sanitized. When ATP comes into contact with the reagents contained in the test device, a reaction takes place that produces light. More light is indicative of higher levels of ATP and a need for more thorough sanitation. Our worldwide customer base for ATP sanitation testing products includes food and beverage processors, the food service and healthcare industries, as well as many other users.

Culture media. Neogen Culture Media, formerly Neogen's Acumedia and Lab M products, offers culture media for varied purposes, including traditional bacterial testing and the growth of beneficial bacteria, such as cultures for sausages and beer. Our customers for culture media also include commercial and research laboratories and producers of pharmaceuticals, cosmetics and veterinary vaccines.

Seafood contaminants. Neogen's specialty products for the seafood market include tests for histamine, a highly allergenic substance that occurs when certain species of fish begin to decay; chloramphenicol, a banned antibiotic in most of the world, but still used by some shrimp farmers to improve the yield of their products; sulfite, an effective but potentially allergenic shrimp preservative; and shellfish toxins.

Waterborne microorganisms. Neogen offers the food and beverage industries, including water companies, several platforms for performing the microbial analysis of water. This includes Neogen's filter tests, which are a combination of Neogen Filter membrane filtration and Neogen Culture Media ampouled media, and easy-to-use Colitag product. With Colitag, after an incubation, the sample changes color in the presence of coliforms and fluoresces in the presence of *E. coli*.

The majority of Neogen's food safety test kits use immunoassay technology to rapidly detect target substances. Our ability to produce high quality antibodies sets our products apart from immunoassay test kits produced and sold by other companies. Our kits are available in microwell formats, which allow for automated and rapid processing of a large number of samples, and lateral flow and other similar devices that provide distinct visual results.

Typically, test kits use antibody-coated test devices and chemical reagents to indicate a positive or negative result for the presence of a target substance in a test sample; the simplicity of the tests makes them accessible to all levels of food producers, processors and handlers. Neogen also offers other test methods and products to complement its immunoassay tests.

Our test kits are generally based on internally developed technology, licensed technology, or technology that is acquired in connection with acquisitions. In fiscal 2019, the Food Safety segment incurred expense totaling $2,210,000 for licenses and royalties for technology used in our products, including expense of $968,000 for allergen products, $380,000 for the pathogen product line and $313,000 for licenses related to the dairy antibiotics product line. Generally, royalty rates are in the range of 2% to 10% of revenues on products containing the licensed technology. Some licenses involve technology that is exclusive to Neogen's use, while others are non-exclusive and involve technology licensed to multiple licensees.

Neogen's international operations in the United Kingdom, Mexico, Brazil, China and India originally focused on food safety products, and each of these units reports through the Food Safety segment. In recent years, these operations have expanded to offer our complete line of products and services, including those usually associated with the Animal Safety segment such as cleaners, disinfectants, rodenticides, insecticides, veterinary instruments and genomics services. These additional products and services are managed and directed by existing management at our international operations, and report through the Food Safety segment.

Revenues from Neogen's Food Safety segment accounted for 51.5%, 48.9% and 47.5% of our total revenues for fiscal years ended May 31, 2019, 2018 and 2017, respectively.

ANIMAL SAFETY SEGMENT

Neogen's Animal Safety segment is primarily engaged in the development, manufacture, marketing and distribution of veterinary instruments, pharmaceuticals, vaccines, topicals, diagnostic products, a full suite of agricultural biosecurity products such as rodenticides, cleaners, disinfectants and insecticides, and genomics services.

Veterinary instruments. Neogen markets a broad line of veterinary instruments and animal health delivery systems under the Ideal brand name. Approximately 250 different products are offered, many of which are used to deliver animal health products, such as antibiotics and vaccines. Ideal's D3 Needles are stronger than conventional veterinary needles and are uniquely detectable by metal detectors at meat processing facilities — a potential market advantage in the safety-conscious beef and swine industries. Neogen's Prima Tech product line consists of highly accurate devices used by farmers, ranchers and veterinarians to inject animals, provide topical applications and to use for oral administration. Prima Tech is also a supplier of products used in artificial insemination in the swine industry. Other products include animal identification and handling equipment.

Veterinary pharmaceuticals. Animal Safety's NeogenVet product line provides innovative, value-added, high quality products to the veterinary market. Top NeogenVet products include PanaKare, a digestive aid that serves as a replacement therapy where digestion of protein, carbohydrate and fat is inadequate due to exocrine pancreatic insufficiency; Natural Vitamin E-AD, which aids in the prevention and treatment of vitamin deficiencies in swine, cattle and sheep; and RenaKare, a supplement for potassium deficiency in cats and dogs. Other products sold under the NeogenVet brand include Vita-15 and Liver 7, which are used in the treatment and prevention of nutritional deficiencies. We also manufacture and market Uniprim, a veterinary antibiotic.

Veterinary biologics. Neogen's BotVax B vaccine has successfully protected thousands of high-value horses and foals against Type B botulism, commonly known as Shaker Foal Syndrome. Our product is the only USDA-approved vaccine for the prevention of Type B botulism in horses. Years of research and many thousands of doses have proven Neogen's EqStim immunostimulant to be safe and effective as a veterinarian-administered adjunct to conventional treatment of equine bacterial and viral respiratory infections. Our ImmunoRegulin product uses similar immunostimulant technology to aid in the treatment of pyoderma (a bacterial skin inflammation) in dogs.

Veterinary OTC products. Animal Safety products offered by Neogen to the retail over-the-counter (OTC) market include Ideal brand veterinary instruments packaged for the retail market. OTC products also include Stress-Dex, an oral electrolyte replacer for performance horses, and Fura-Zone, for the prevention and treatment of surface bacterial infections in wounds, burns and cutaneous ulcers. Hoof care, disposables and artificial insemination supplies are marketed to the dairy and veterinary industries.

Rodenticides. Neogen's comprehensive line of proven rodenticides, sold under brand names such as Ramik and Havoc, effectively address rodent problems of any size and serve as a critical component of an overall biosecurity plan for animal protein production operations. Neogen offers several rodenticide active ingredients including diphacinone, bromethalin, brodifacoum, and zinc phosphide formulated with food grade ingredients to generate the highest acceptance and most palatable bait possible.

Cleaners and disinfectants. Used in animal and food production facilities, Neogen's cleaners and disinfectants, including DC&R, 904 Disinfectant, Acid-A-Foam, Synergize, BioPhene, Viroxide Super and FarmFluid S, can stop a disease outbreak before it starts. The products are also used in the veterinary clinic market to maintain sanitary conditions and limit the potential hazards of bacteria, fungi and viruses. Neogen's water line cleaner and disinfectant products, including Peraside, MaxKlor, AquaPrime and Siloxycide, clean water lines, and provide continuous disinfection of a livestock facility's water supply.

Insecticides. Neogen's highly effective insecticides utilize environmentally friendly technical formulas, and several are approved for use in food establishments. The Company's Prozap insecticide brand is well known in the large animal production industry, particularly with dairy and equine producers.

Animal genomics services. Neogen Genomics, formerly known as GeneSeek and Igenity, provides value-added services to leading agricultural genetics providers, large national cattle associations, companion animal breed registries, university researchers, and numerous commercial beef and dairy cattle, swine and poultry producers. With state-of-the-art genomics laboratories and the comprehensive bioinformatics to interpret genomics test results, Neogen offers identity and trait determination and analysis. Our technology employs high-resolution DNA genotyping for identity and trait analysis in a variety of important animal and agricultural plant species. Our extensive bioinformatics database identifies and predicts an animal's positive or negative traits based on DNA test results. This information has helped livestock producers make significant improvements in the genomic makeup and overall quality of their animals.

Life sciences. Neogen's line of approximately 100 drug detection immunoassay test kits is sold worldwide for the detection of approximately 300 abused and therapeutic drugs in farm animals and racing animals, and for detection of drug residues in meat and meat products. The test kits are also used for human forensic toxicology drug screening applications. This line includes tests for narcotics, analgesics, stimulants, depressants, tranquilizers, anesthetics, steroids and diuretics. Neogen also has several products used by researchers for the detection of biologically active substances.

Many of the products and services in the Animal Safety segment use licensed technology. In fiscal year 2019, Animal Safety incurred expense totaling $585,000 for licenses and royalties for technology used in our products and services, including expense of $313,000 for licenses related to the genomics services line.

Revenues from Neogen's Animal Safety segment accounted for 48.5%, 51.1% and 52.5% of our total revenues for fiscal years ended May 31, 2019, 2018 and 2017, respectively.

GENERAL SALES AND MARKETING

Neogen is organized under two segments — Food Safety and Animal Safety. Within these segments, our sales efforts are generally organized by specific markets, rather than by products or geography. During the fiscal year that ended May 31, 2019, we had approximately 27,000 customers for our products. Since many customers for animal safety products are distributors, and certain animal safety products are offered to the general retail market, the total number of end users of our products is considerably greater than 27,000. As of May 31, 2019, a total of 423 employees were assigned to sales and marketing functions, compared to 401 at the end of May 2018. During the fiscal years ended May 31, 2019, 2018 and 2017, no single customer or distributor accounted for 10% or more of our revenues.

DOMESTIC SALES AND MARKETING

FOOD SAFETY

To reach each customer and prospect with expertise and experience, Neogen has a staff of specialized food safety sales and technical service representatives assigned to specific markets. This staff sells our products directly to end users, and also handles technical support issues that arise with customers in the United States and Canada.

Neogen's food safety markets are primarily comprised of:

- **Milling and grain**, including grain elevators, feed mills, pet food manufacturers, and grain inspection companies;
- **Meat and poultry**, including meat and poultry processors, producers of ready-to-eat meat and poultry products, and the USDA's Food Safety Inspection Service (FSIS);
- **Grocery products**, including flour millers, malters, bakeries, candy and confection manufacturers, manufacturers of prepared meals, nuts, spices, cookies, crackers and other snack foods;
- **Fruits and vegetables**, including growers and processors of juice and packaged fresh cut grocery items;

- **Seafood**, including harvesters and processors of a wide variety of seafood products;
- **Dairy**, including milk and yogurt processors;
- **Beverage**, including soft drink bottlers and beer and wine producers;
- **Healthcare**, including hospitals and distributors to the healthcare industry;
- **Traditional culture media markets**, including commercial and research laboratories and producers of pharmaceuticals, cosmetics and veterinary vaccines;
- **Food service**, including fast food service establishments and retail grocery market chains; and
- **Nutraceuticals**, including producers and marketers of a wide variety of nutritional and holistic consumer products.

ANIMAL SAFETY

Neogen's staff of specialized animal safety sales, marketing, customer and technical service representatives sell our products and services directly to consumers, dealers, veterinarians, distributors and other manufacturers and also handle domestic technical support issues. Neogen further supports its distribution channels through product training, field support, various promotions and advertising.

Neogen's animal safety markets are primarily comprised of:

- **Companion animal veterinarians.** Neogen has a dedicated sales group that sells and technically supports the Company's animal care, biosecurity and disposable products to the companion animal veterinary market.
- **Livestock producers, veterinarians and associations.** Neogen has a dedicated group of sales professionals that sells the Company's comprehensive suite of biosecurity and husbandry products and genomics services directly to livestock producers, and livestock veterinarians and veterinary clinics.
- **Distributors.** To expand the reach of its animal safety OTC and veterinary products, Neogen has a dedicated sales team that sells the Company's products to animal health product distributors.
- **Retailers.** Neogen offers select animal care and biosecurity products directly to large farm and ranch retailers for sale directly to consumers.
- **Diagnostic labs and universities.** Neogen has a dedicated lab, manufacturing, sales and technical service group that call on large commercial and forensic testing laboratories and universities.
- **Other manufacturers and government agencies.** Neogen has an experienced group of professionals who work directly with other manufacturers and government agencies to provide custom solution products and services for their needs.

INTERNATIONAL SALES AND MARKETING

Neogen maintains 10 Company-owned locations outside of the United States to provide a direct presence in regions of particular importance to us, and maintains an extensive network of distributors to reach countries where we do not have a direct presence.

Neogen Europe. Neogen Europe, Ltd., located in Ayr, Scotland, sells products and services to our network of customers and distributors throughout the European Union (E.U.). Customers in the United Kingdom (U.K.), France, Germany and the Netherlands are served by our employees. In other European regions, customers are generally serviced by distributors managed by Neogen Europe personnel. Neogen Europe's research and development team continues to be a strong asset in the development of products tailored to meet the unique requirements of the European market. Neogen Europe management is also responsible for sales and marketing for our England-based Lab M and Quat-Chem businesses. Lab M, located in Heywood, England, has an extensive range of microbiological culture media, supplements, immunomagnetic separation techniques and proficiency testing systems are used in laboratories around the world. In December 2016, Neogen acquired Quat-Chem Ltd., a Rochdale, England-based chemical company specializing in the development, manufacture and sale of agricultural, industrial, and food processing biocidal hygiene products, including cleaners and disinfectants. Quat-Chem sells its products on a global basis, with a focus on the U.K., E.U., Middle East and Asia.

Neogen Latinoamérica. Our subsidiary in Mexico, Neogen Latinoamérica, is headquartered near Mexico City and distributes Neogen's products throughout Mexico and Central America. Neogen Latinoamérica manages our business activities throughout the region by marketing to animal and crop producers and food processors, utilizing our direct sales representatives to sell Food Safety products and genomics services, while marketing cleaners, disinfectants and other Animal Safety products primarily through distributors.

Neogen do Brasil. Neogen do Brasil, headquartered near São Paulo, distributes Neogen's products throughout Brazil. Brazil is one of the world leaders in the export of numerous food commodities, including beef, poultry, soybeans, coffee, sugar and orange juice, and this operation gives us direct sales representation to these important markets. Neogen do Brasil management is also responsible for sales and marketing for our Brazil-based Deoxi and Rogama businesses. Neogen owns Deoxi Biotecnologia Ltda, a genomics testing laboratory, which we purchased in April 2016. In December 2016, we acquired Brazil-based Rogama Indústria e Comércio Ltda., a company which develops, manufactures and markets rodenticides and insecticides. Rogama offers more than 70 registered pest control products to Brazil's agronomic, professional and retail markets. Both businesses are operated out of the same location in Pindamonhangaba**,** Brazil.

Neogen China. Our Chinese subsidiary, located in Shanghai, employs sales representatives who sell directly to Chinese customers. China's burgeoning middle class, with its rapidly growing demand for higher quality meat and dairy products, makes the country a substantial growth opportunity for Neogen products and services — both for animal production on the country's farms, and in processing plants throughout China's food production and distribution channels. We utilize both direct sales representatives and distributors to sell our complete portfolio in this growing market.

Neogen India. In June 2015, Neogen acquired the assets of Sterling Test House, a leading commercial food testing laboratory based in southwest India, to serve as a base for our operations in India. This business, renamed Neogen India, includes food safety and water quality testing for major hotels and restaurants in its home region, as well as safety and quality analysis for the country's expanding nutraceutical market, and growing food export businesses. The laboratory is located in Kochi, in the state of Kerala, which is India's leading region for the export of spices, tea, and fresh fruits and vegetables. In late fiscal 2016, Neogen transferred sales responsibility for our Food Safety products directly to sales representatives at Neogen India.

Neogen Australasia. In September 2017, Neogen acquired the assets of The University of Queensland Animal Genetics Laboratory (AGL) — the leading animal genomics laboratory in Australia, a country with large cattle and sheep markets. The acquisition of AGL was intended to help accelerate the growth of our animal genomics business in Australia and New Zealand. With the acquisition, AGL was renamed Neogen Australasia.

Neogen Canada. In January 2019, Neogen acquired the assets of the Edmonton-based Delta Genomics Centre — a major animal genomics laboratory in Canada. With the acquisition, Delta's laboratory operations were renamed Neogen Canada, and became Neogen's sixth animal genomics laboratory — joining locations in the U.S., Scotland, Brazil, China and Australia. The acquisition is intended to help accelerate the growth of Neogen's animal genomics business throughout Canada.

Dairy antibiotics distributor. Neogen's dairy antibiotics diagnostic products are marketed directly to customers in North America, Brazil and China, and distributed elsewhere worldwide by Denmark based Chr. Hansen, an international supplier of natural ingredient solutions for the food, health and nutritional industries.

Other distributor partners. Outside of our physical locations and dairy antibiotics distributor mentioned above, Neogen uses our own sales managers in both the Food Safety and Animal Safety segments to work closely with and coordinate the efforts of a network of approximately 150 distributors in more than 100 countries. The distributors provide local training and technical support, perform market research and promote Company products within designated countries around the world.

Sales to customers outside the United States accounted for 40.1%, 37.6% and 35.7% of our total revenues for fiscal years ended May 31, 2019, 2018 and 2017, respectively. No individual foreign country contributed 10% or more of our revenues for those same periods.

RESEARCH AND DEVELOPMENT

Management maintains a strong commitment to Neogen's research and development activities. Our product development efforts are focused on the enhancement of existing products and in the development of new products that fit our business strategy. As of May 31, 2019, we employed 101 individuals in our worldwide research and development group, including immunologists, chemists and microbiologists. Research and development costs were approximately $12.8 million, $10.9 million and $10.4 million representing 3.1%, 2.7% and 2.9% of total revenues in fiscal years 2019, 2018 and 2017, respectively. Management currently expects our future research and development expenditures to approximate 3% of total revenues annually.

Neogen has ongoing development projects for several new and improved diagnostic tests and other complementary products for both the Food Safety and Animal Safety markets. Management expects that a number of these products will be commercially available at various times during fiscal years 2020 and 2021.

Portions of certain technologies utilized in some products manufactured and marketed by Neogen were acquired from or developed in collaboration with affiliated partnerships, independent scientists, governmental units, universities and other third parties. We have entered into agreements with these parties that provide for the payment of license fees and royalties based upon sales of products that utilize the pertinent technology. License fees and royalties, expensed to sales and marketing, under these agreements amounted to $2,795,000, $2,876,000 and $2,659,000 in fiscal years 2019, 2018 and 2017, respectively.

PROPRIETARY PROTECTION AND APPROVALS

Neogen uses trade secrets as proprietary protection in many of its food and animal safety products. In many cases, we have developed unique antibodies capable of detecting microorganisms and residues at minute levels. The supply of these antibodies, and the proprietary techniques utilized for their development, may offer better protection than the filing of patents. Such proprietary reagents are maintained in secure facilities and stored in more than one location to reduce exposure to complete destruction by natural disaster or other means.

Patent and trademark applications are submitted whenever appropriate. Since its inception, Neogen has acquired and received numerous patents and trademarks, and has several pending patents and trademarks. The patents expire at various times over the next 23 years.

A summary of patents by product categories follows:

	USA	International	Expiration
Natural Toxins, Allergens, & Drug Residues	23	27	2021-2026
Bacterial & General Sanitation	3	0	2021
Life Sciences	0	4	2024
Vaccine	1	0	2028
Veterinary Instruments & Other	15	50	2019-2042
Genomics Services	18	4	2021-2029

We do not expect the near-term expiration of any single patent to have a significant effect on future results of operations.

Management believes that Neogen has adequate protection regarding proprietary rights for our products. However, we are aware that substantial research has taken place at universities, governmental agencies and other companies throughout the world and that numerous patents have been applied for and issued for technologies which may be used in our products. To the extent some of our products may now, or in the future, embody technologies protected by patents, copyrights or trade secrets of others, licenses to use such technologies may need to be obtained to continue to sell the products. These licenses may not be available on commercially reasonable terms. Failure to obtain any such licenses may delay or prevent the sale of certain new or existing products. In addition, patent litigation is not uncommon. Accordingly, there can be no assurance that our existing patents will be sufficient to completely protect our proprietary rights.

One of the major areas affecting the success of biotechnology development involves the time, cost and uncertainty surrounding regulatory approvals. Neogen products requiring regulatory approval, which we currently have in place, include BotVax B, EqStim, ImmunoRegulin, Uniprim and BetaStar. Our general strategy is to select technical and proprietary products that do not require mandatory approval by regulatory bodies to be marketed. Neogen's rodenticide, disinfectant and insecticide products are subject to registration in the United States and internationally.

Neogen utilizes third-party validations on many of our disposable test kits as a marketing tool to provide our customers with assurances that our products perform to specified levels. These include validation by the AOAC International, independently administered third-party, multi-laboratory collaborative studies and approvals by the U.S. Federal Grain Inspection Service and the USDA Food Safety Inspection Service for the use of our products in their operations.

PRODUCTION AND SUPPLY

Neogen manufactures our products in Michigan, Kentucky, Wisconsin, North Carolina, Iowa, Tennessee, California, the United Kingdom and Brazil and provides genomics services in Nebraska, Scotland, Brazil, Australia, China and Canada. As of May 31, 2019, there were approximately 893 full-time employees assigned to manufacturing and providing of services in these locations, operating on one or two shifts; with occasional 24/7 production during high demand periods. Future demand increases could be accommodated by adding shifts. Management believes we could increase the current output of our primary product lines by more than 50% using the current space available; however, to do so would require investment in additional equipment.

Food safety diagnostics. Manufacturing of diagnostic tests for the detection of natural toxins, pathogens, food allergens, dairy antibiotics, spoilage organisms and pesticides, final kit assembly, quality assurance and shipping takes place at our facilities in Lansing, Michigan. Proprietary monoclonal and polyclonal antibodies for Neogen's diagnostic kits are produced on a regular schedule in our immunology laboratories in Lansing. Generally, final assembly and shipment of diagnostic test kits to customers in Europe is performed in our Ayr, Scotland facility. Most of the Company's food

safety diagnostic instruments and readers are produced by third-party vendors to our specifications, quality tested in Lansing, and then shipped to customers. Culture media products are manufactured in a FDA-registered facility in Lansing and in Heywood, England. Products are blended following strict formulations or custom blended to customer specification and shipped directly to customers from Lansing and Heywood.

Animal health products. Manufacturing of animal health products, pharmacological diagnostic test kits and test kits for drug residues takes place in our FDA-registered facilities in Lexington, Kentucky. In general, manufacturing operations including reagent manufacturing, quality assurance, final kit assembly and packaging are performed by Neogen personnel. Certain animal health products and veterinary instruments that are purchased finished or that are toll manufactured by third party vendors are warehoused and shipped from our Lexington facilities. Other veterinary instruments are produced in our facilities in Lansing, and are generally then shipped to Lexington, for distribution to customers. Manufacturing and shipment of devices used for animal injections, topical applications and oral administration occurs in Kenansville, North Carolina.

Veterinary biologics. Neogen maintains a Lansing-based USDA-approved manufacturing facility devoted to the production of the biologic products EqStim and ImmunoRegulin. *P.acnes* seed cultures are added to media and then subjected to several stages of further processing resulting in a finished product that is filled and packaged within the facility. Our BotVax B vaccine is also produced in the Lansing facility utilizing Type B botulism seed cultures and a traditional fermentation process. All completed biologic products are then shipped to Neogen's Lexington facilities where they are inventoried prior to distribution to customers.

Agricultural genomics services. Neogen offers agricultural genomics laboratory services and bioinformatics at our locations in Nebraska, Scotland, Brazil, Australia, China and Canada. Through our laboratory services and bioinformatics (primarily in beef and dairy cattle, pigs, sheep, poultry, horses and dogs), Neogen Genomics allows our customers to speed genetic improvement efforts, as well as identify economically important diseases.

Cleaners, disinfectants and rodenticides. Manufacturing of rodenticides and/or cleaners and disinfectants takes place in the following locations: Randolph, Wisconsin; Memphis, Tennessee; Turlock, California; Rochdale, England; and Pindamonhangaba, Brazil. Manufacturing of rodenticides consists of blending technical material (active ingredient) with bait consisting principally of various grains. Certain cleaners and disinfectants are manufactured in Neogen facilities, while others are purchased from other manufacturers for resale, or toll manufactured by third parties.

Insecticides. Neogen manufactures insecticides and other pesticides at its facilities in Pleasantville, Iowa and Pindamonhangaba, Brazil.

Neogen purchases component parts and raw materials from more than 1,000 suppliers. Though many of these items are purchased from a single source to achieve the greatest volume discounts, we believe we have identified acceptable alternative suppliers for most of our key components and raw materials where it is economically feasible to do so. There can be no assurance that we would avoid a disruption of supply in the event a supplier discontinues shipment of product. Shipments of products are generally accomplished within a 48-hour turnaround time. Because of this quick response time, our backlog of unshipped orders at any given time has historically not been significant.

COMPETITION

Although competitors vary in individual markets, management knows of no competitor that is pursuing Neogen's fundamental strategy of developing and marketing a broad line of products, ranging from disposable tests and culture media to veterinary pharmaceuticals and instruments for a large number of food safety and animal safety concerns. For each of our individual products or product lines, we face intense competition from companies ranging from small businesses to divisions of large multinational companies. Some of these organizations have substantially greater financial resources than Neogen. We compete primarily on the basis of ease of use, speed, accuracy and other similar performance characteristics of our products. The breadth of our product line, the effectiveness of our sales and customer service organizations, and pricing are also components in management's competitive strategy.

Future competition may become even more intense, and could result from the development of new technologies, which could affect the marketability and profitability of Neogen's products. Our competitive position will also depend on management's ability to continue to develop proprietary products, attract and retain qualified scientific and other personnel, develop and implement production and marketing plans and obtain patent protection for new products. Additionally, we must have adequate capital resources to execute our strategy.

FOOD SAFETY:

With a large professional sales organization offering a comprehensive catalog of food safety solutions, management believes we maintain a general advantage over competitors offering only limited product lines. In most cases, Neogen sales and technical service personnel can offer unique insight into a customer's numerous safety and quality challenges, and offer testing and other solutions to help the customer overcome those challenges.

Competition for pathogen detection products includes traditional methods and antibody and genetic-based platforms; competition for natural toxins and allergen detection products include instrumentation and antibody-based tests. While our offerings will not always compete on all platforms in all markets, the products we offer provide tests that can be utilized by most customers to meet their testing needs.

In addition to our extensive product offerings and robust distribution network, we focus our competitive advantage in the areas of customer service, product performance, speed, and ease of use of our products. Additionally, by aggressively maintaining Neogen as a low-cost producer, we believe that we can be competitive with new market entrants that may choose a low pricing strategy in an attempt to gain market share.

ANIMAL SAFETY:

Neogen's Animal Safety segment faces no one competitor across the products and markets we serve. In the racing industry market, we believe we hold a leading market share position. In the life sciences and forensics markets, we compete against several other diagnostic and reagent companies with similar product offerings.

In the veterinary market, Neogen markets BotVax B, the only USDA-approved vaccine for the prevention of botulism Type B in horses. We compete on other key products through differentiated product performance and superior customer and technical support. With some of our products, we provide solutions as a lower cost alternative and also offer a private label option for our distributors.

Competition in the rodenticide market includes several companies of comparable size that offer products into similar market segments. The retail rodenticide market is not dominated by a single brand. While the technical materials used by competing companies are similar, Neogen uses manufacturing and bait formula techniques which we believe may better attract rodents to the product and thereby improves overall product performance.

Within the insecticide market, Chem-Tech products specifically focus on the area of insect control for food and animal safety applications. There are several competitors offering similar products, however, we have a proprietary formulation chemistry that optimizes the delivery and safe application of insecticides at the customer's location. These products are currently only sold in the U.S. through a combination of direct sales and distributors.

Numerous companies, including a number of large multinationals, compete for sales in the cleaner and disinfectant product segment. Neogen's broad line of products are sold through our distributor network around the world, primarily to assist in the cleaning and disinfecting of animal production facilities.

In addition to our extensive portfolio of Animal Safety products, Neogen also competes in the retail market by providing solutions to common retail problems, such as stock outs, wasted floor space and inconsistent brand identity. We differentiate ourselves by offering planograms and convenient reordering systems to maximize turns and profitability for our retail customers.

Neogen Genomics, which includes the leading commercial agricultural genomics laboratory in the U.S., employs cutting-edge technology in the area of genomics. The result of this technology allows the acceleration of natural selection through selective breeding of traits such as disease resistance, yield improvement and meat quality. Competition comes mainly from a number of service providers, some significantly larger than us, whose primary focus are the human and pharmaceutical industries, as well as several smaller companies offering genomics services. Neogen Genomics is not involved in cloning or the development of transgenic animals.

GOVERNMENT REGULATION

A significant portion of Neogen's products and revenues are affected by the regulations of various domestic and foreign government agencies, including the U.S. Department of Agriculture (USDA), the Environmental Protection Agency (EPA), and the U.S. Food and Drug Administration (FDA). Changes in these regulations could affect revenues and/or costs of production and distribution.

Neogen's development and manufacturing processes involve the use of certain hazardous materials, chemicals and compounds. Management believes that our safety procedures for handling and disposing of such commodities comply with the standards prescribed by federal, state and local regulations; however, changes in such regulations or rules could involve significant costs to us and could be materially adverse to our business.

The rodenticides, insecticides, cleaners, disinfectants and sanitizers manufactured and distributed by Neogen are subject to EPA and various state regulations. In general, any international sale of our products must also comply with similar regulatory requirements in the country of destination. Each country has its own individual regulatory construct with specific requirements (e.g., label in the language of the importing country). To the best of our knowledge, Neogen products are in compliance with applicable regulations in the countries where such products are sold.

Dairy diagnostic products used in National Conference on Interstate Milk Shipments (NCIMS), a cooperative program involving FDA, state governments and the industry, must first be approved. Before products requiring NCIMS approval can be sold in the U.S., extensive product performance data must be submitted in accordance with FDA-approved protocol administered by the AOAC Research Institute (AOAC RI). Following approval of a product by NCIMS, the product must be reviewed by the FDA. Our BetaStar Advanced U.S. dairy antibiotic residue testing product has been reviewed and/or approved by the appropriate regulatory bodies.

Many of the food safety diagnostic products do not require direct government approval. However, we have pursued AOAC approval for a number of these products to enhance their marketability.

Neogen's veterinary vaccine products and some pharmaceutical products require government approval to allow for lawful sales. The vaccine products are approved by the U.S. Department of Agriculture, Center for Veterinary Biologics (USDA-CVB) and the pharmaceutical products are approved by the FDA. The products, and the facilities in which they are manufactured, are in a position of good standing with both agencies. We have no warning letters based on any review of these products or facility inspection, no recalls on any of these products, and are not aware of any reason why we could not manufacture and market such products in the future.

Other animal safety and food safety products generally do not require additional registrations or approvals. However, Neogen's regulatory staff routinely monitors amendments to current regulatory requirements to ensure compliance.

EMPLOYEES

As of May 31, 2019, we employed 1,682 full-time persons worldwide. None of the employees are covered by collective bargaining agreements. There have been no work stoppages or slowdowns due to labor-related problems, and management believes that our relationship with our employees is generally good. Employees with access to proprietary information have executed confidentiality agreements with Neogen.

ITEM 1A. RISK FACTORS

An investment in Neogen Corporation's common shares involves a high degree of risk. The risks described below are not the only ones that an investor faces. Additional risks that are not yet known to us or that we currently think are immaterial could also impair our business, financial condition or results of operations. If any of the following risks actually occurs, our business, financial condition or results of operations could be adversely affected.

Risks Relating to Our Business

Our business strategy is dependent on successfully promoting internal growth and identifying and integrating acquisitions.

Our business has grown significantly over the past several years as a result of both internal growth and acquisitions of existing businesses and their products. Management initiatives may be attempted to augment internal growth, such as strengthening our presence in select markets, reallocating research and development funds to higher growth potential products, development of new applications for our technologies, enhancing our service offerings, continuing key customer efforts, and finding new markets for our products. Failure of these management initiatives may have a material adverse effect on our operating results and financial condition.

Identifying and pursuing acquisition opportunities, integrating these acquisitions into our business and managing their growth requires a significant amount of management's time and skill. We cannot assure that we will be effective in identifying, integrating or managing future acquisition targets. Our failure to successfully integrate and manage a future acquisition may have a material adverse effect on our operating results and financial condition.

In addition, if we continue to experience growth in our business, such growth could place a significant strain on our management, customer service, operations, sales and administrative personnel, and other resources. To serve the needs of our existing and future customers we will be required to recruit, train, motivate and manage qualified employees. We have incurred and will continue to incur significant costs to retain qualified management, sales and marketing, engineering, production, manufacturing and administrative personnel, as well as expenses for marketing and promotional activities. Our ability to manage our planned growth depends upon our success in expanding our operating, management, information and financial systems, which might significantly increase our operating expenses.

We may not be able to effectively manage our future growth, and if we fail to do so, our business, financial condition and results of operations could be adversely affected.

We rely significantly on our information systems infrastructure to support our operations and a failure of these systems and infrastructure and/or a security breach of our information systems could damage our reputation and have an adverse effect on operations and results.

We rely on our information systems infrastructure to integrate departments and functions, to enhance our ability to service customers, to improve our control environment and to manage our cost reduction initiatives. If a security breach or cyberattack of our IT networks and systems occurs, our operations could be interrupted. Any issues involving our critical business applications and infrastructure may adversely impact our ability to manage our operations and the customers we serve. Although we have controls and security measures in place to prevent such attacks, experienced computer hackers are increasingly organized and sophisticated. Malicious attack efforts operate on a large-scale and sometimes offer targeted attacks as a paid-for service. In addition, the techniques used to access or sabotage networks change frequently and generally are not recognized until launched against a target.

We rely on several information systems throughout our company, as well as those of our third-party business partners, to provide access to our web-based products and services, keep financial records, analyze results of operations, process customer orders, manage inventory, process shipments to customers, store confidential or proprietary information and operate other critical functions. Although Neogen employs system backup measures and engages in information system redundancy planning and processes, such measures, planning and processes, as well as our current disaster recovery plan, may be ineffective or inadequate to address all vulnerabilities. Further, our information systems and our business partners' and suppliers' information systems may be vulnerable to attacks by hackers and other security breaches, including computer viruses and malware, through the Internet (including via devices and applications connected to the Internet), email attachments and persons with access to these information systems, such as our employees or third parties with whom we do business. As information systems and the use of software and related applications by us, our business partners, suppliers, and customers become more cloud-based, there has been an increase in global cybersecurity vulnerabilities and threats, including more sophisticated and targeted cyber-related attacks that pose a risk to the security of our information systems and networks and the confidentiality, availability and integrity of data and information.

While we have implemented network security and internal control measures, especially for the purpose of protecting our connected products and services from cyberattacks, and invested in our data and information technology infrastructure, there can be no assurance that these efforts will prevent a system disruption, attack, or security breach and, as such, the risk of system disruptions and security breaches from a cyberattack remains.

In addition, if our security and information systems are compromised, or employees fail to comply with the applicable laws and regulations, or this information is obtained by unauthorized persons or used inappropriately, it could adversely affect our reputation, as well as results of operations, and could result in litigation, the imposition of penalties, or significant expenditures to remediate any damage to persons whose personal information has been compromised.

Disruption of our manufacturing and service operations could have an adverse effect on our financial condition and results of operations.

We manufacture our products at several manufacturing facilities located in the following locations: Lansing, Michigan; Lexington, Kentucky; Randolph, Wisconsin; Kenansville, North Carolina; Pleasantville, Iowa; Memphis, Tennessee; Turlock, California; Heywood, England; Ayr, Scotland; Rochdale, England; and Pindamonhangaba, Brazil. We offer genomics services from facilities located in: Lincoln, Nebraska; Ayr, Scotland; Pindamonhangaba, Brazil; Edmonton, Canada; Shanghai, China and Gatton, Australia. These facilities and our distribution systems are subject to catastrophic loss due to fire, flood, terrorism or other natural or man-made disasters. If any of these facilities were to experience a catastrophic loss, it could disrupt our operations, delay production, shipments and revenue and result in significant expenses to repair or replace the facility and/or distribution system. If such a disruption were to occur, we could breach agreements, our reputation could be harmed, and our business and operating results could be adversely affected. Although we carry insurance for property damage and business interruption, we do not carry insurance or financial reserves for interruptions or potential losses arising from terrorism. Economic conditions and uncertainties in global markets may adversely affect the cost and other terms upon which we are able to obtain third party insurance. If we are unable to obtain sufficient and cost effective third-party insurance coverage, or to the extent we have elected to self-insure, we may be at greater risk that our operations will be harmed by a catastrophic loss.

Our dependence on suppliers could limit our ability to sell certain products or negatively affect our operating results.

We rely on third-party suppliers to provide components in our products, manufacture products that we do not manufacture ourselves and perform services that we do not provide ourselves. Because these suppliers are independent third parties with their own financial objectives, actions taken by them could have a negative effect on our results of operations. The risks of relying on suppliers include our inability to enter into contracts with third party suppliers on reasonable terms, inconsistent or inadequate quality control, relocation of supplier facilities, supplier work stoppages and suppliers' failure to comply with their contractual obligations. In addition, we currently purchase some raw materials and products from sole or single sources. Some of the products that we purchase from these sources are proprietary and, therefore, cannot be readily or easily replaced by alternative sources. Problems with suppliers could negatively impact our ability to supply the market, substantially decrease sales, lead to higher costs or damage our reputation with our customers.

We rely heavily on third-party package delivery services, and a significant disruption in these services or significant increases in prices may disrupt our ability to ship products, increase our costs and lower our profitability.

We ship a significant portion of our products to customers through independent package delivery companies, such as UPS, Federal Express and DHL. We also ship our products through other carriers, including national and regional trucking firms, overnight carrier services and the U.S. Postal Service. If one or more of these third-party package delivery providers were to experience a major work stoppage, preventing our products from being delivered in a timely fashion or causing us to incur additional shipping costs we could not pass on to our customers, our costs could increase and our relationships with some of our customers could be adversely affected. In addition, if one or more of our third-party package delivery providers were to increase prices, and we were not able to find comparable alternatives or make adjustments within our delivery network, our profitability could be adversely affected.

Our business sells many products through distributors, which present risks that could negatively affect our operating results.

We sell many of our products, both within and outside of the U.S., through distributors. As a result, we are dependent on these distributors to sell our products and assist us in promoting and creating a demand for our products. Our distributors sometimes offer products from several different companies, and those distributors may carry our competitors' products and promote our competitors' products over our own. We have limited ability, if any, to cause our distributors to devote adequate resources to promoting, marketing, selling and supporting our products. We cannot assure that we will be successful in maintaining and strengthening our relationships with our distributors or establishing relationships with new distributors who have the ability to market, sell and support our products effectively. We may rely on one or more key distributors for a product or region, and the loss of one or more of these distributors could reduce our revenue. Distributors may face financial difficulties, including bankruptcy, which could impact our ability to collect our accounts receivable and negatively impact our financial results. In addition, violations of anti-corruption laws or similar laws by our distributors could have a material impact on our business, and any termination of a distributor relationship may result in increased competition in the applicable jurisdiction. Failing to manage the risks associated with our use of distributors may reduce sales, increase expenses and weaken our competitive position, which could have a negative impact on our operating results.

The development of new products entails substantial risk of failure due to the production of non-viable products, lack of properly identifying market potential, and competitors better serving the marketplace.

Our growth strategy includes significant investment in and expenditures for product development. To execute this strategy, we are continually developing new products for which we believe there should be significant market demand. We cannot assure that we will successfully develop commercially viable products, that the products will be developed on a timely basis to meet market demand or that the relevant market will be properly identified. Our competitors may also adapt more quickly, and deliver superior technologies, price and/or service to better fit our customers' requirements. If we expend substantial resources in developing an unsuccessful product, whether that lack of success is the result of our production of a non-viable product, a misidentified market, or a competitor's superior ability to meet our customers' requirements, operating results could be adversely affected.

The markets for our products are extremely competitive, and our competitors may be able to utilize existing resource advantages to our detriment.

The markets in which we compete are subject to rapid and substantial changes in technology and are characterized by extensive research and development and intense competition. Our competitors and potential competitors may have greater financial, technical, manufacturing, marketing, research and development and management resources than we do. These competitors might be able to use their resources, reputations and ability to leverage existing customer relationships to give them a competitive advantage over us. They might also succeed in developing products that are more reliable and effective than our products, make additional measurements, are less costly than our products or provide alternatives to our products.

We are dependent on the agricultural marketplace, which is affected by factors beyond our control.

Our primary customers are in the agricultural and food production industries. Economic conditions affecting agricultural industries are cyclical and are dependent upon many factors outside of our control, including weather conditions, changes in consumption patterns or commodity prices. Any of these factors in the agricultural marketplace could affect our sales and overall financial performance.

Our quarterly operating results are subject to significant fluctuations.

We have experienced, and may experience in the future, significant fluctuations in our quarterly operating results. The mix of products sold and the acceptance of new products, in addition to other factors, could contribute to this quarterly variability. We operate with relatively little backlog and have few long-term customer contracts. Substantially all our product revenue in each quarter results from orders received in that quarter. In addition, our expense levels are based, in part, on our expectation of future revenue levels. A shortfall in expected revenue could, therefore, result in a disproportionate decrease in our net income.

Our success is highly dependent on our ability to obtain protection for the intellectual property utilized in our products.

Our success and ability to compete depends in part upon our ability to obtain protection in the U.S. and other countries for our products by establishing and maintaining intellectual property rights relating to or incorporated into our technology and products. Patent applications filed by us may not result in the issuance of patents or, if issued, may not be issued in a form that will be commercially advantageous to us. Even if issued, patents may be challenged, narrowed, invalidated or circumvented, which could limit our ability to stop competitors from marketing similar products or limit the length of time we may have patent protection for our products. We also cannot assure that our nondisclosure agreements, together with trade secrets and other common law rights, will provide meaningful protection for our trade secrets and other proprietary information. Moreover, the laws of some foreign jurisdictions may not protect intellectual property rights to the same extent as in the U.S., and many companies have encountered significant difficulties in protecting and defending such rights in foreign jurisdictions. If we encounter such difficulties or we are otherwise precluded from effectively protecting our intellectual property rights domestically or in foreign jurisdictions, we may incur substantial costs and our business, including our business prospects, could be substantially harmed.

From time to time, we have received notices alleging that our products infringe third-party proprietary rights. Whether the manufacture, sale or use of current products, or whether any products under development would, upon commercialization, infringe any patent claim will not be known with certainty unless and until a court interprets the patent claim in the context of litigation. When an infringement allegation is made against us, we may seek to invalidate the asserted patent claim and/or to allege non-infringement of the asserted patent claim. For us to invalidate a U.S. patent claim, we would need to rebut the presumption of validity afforded to issued patents in the U.S. with clear and convincing evidence of invalidity, which is a high burden of proof. The outcome of infringement litigation is subject to substantial uncertainties, and also the testimony of experts as to technical facts upon which experts may reasonably disagree. Our defense of an infringement litigation lawsuit could result in significant expense. Regardless of the outcome, infringement litigation could significantly disrupt our marketing, development and commercialization efforts, divert management's

attention and consume our financial resources. In the event that we are found to infringe any valid claim in a patent held by a third party, we may, among other things, be required to:

- Pay damages, including up to treble damages and the other party's attorneys' fees, which may be substantial;
- Cease the development, manufacture, importation, use and sale of products that infringe the patent rights of others, through a court-imposed injunction;
- Expend significant resources to redesign our technology so that it does not infringe others' patent rights, or develop or acquire non-infringing intellectual property, which may not be possible;
- Discontinue manufacturing or other processes incorporating infringing technology; and/or
- Obtain licenses to the infringed intellectual property, which may not be available to us on acceptable terms, or at all.

Any development or acquisition of non-infringing products, technology or licenses could require the expenditure of substantial time and other resources and could have a material adverse effect on our business and financial results. If we are required to, but cannot, obtain a license to valid patent rights held by a third party, we would likely be prevented from commercializing the relevant product, or from further manufacture, sale or use of the relevant product.

We are subject to substantial governmental regulation.

A portion of our products and facilities are regulated by various domestic and foreign government agencies including, but not limited to, the U.S. Department of Agriculture, the U.S. Food and Drug Administration and the Environmental Protection Agency. A significant portion of our revenue is derived from products used to monitor and detect the presence of residues that are regulated by various government agencies. Furthermore, our growth may be adversely affected by the implementation of new regulations. The costs of compliance or failure to comply with any obligations related to these laws or regulations could adversely impact our business.

We are dependent on key employees.

Our success depends, in large part, on members of our management team. Our loss of any of these, or other, key employees could have a material adverse effect on us. We have not executed long-term employment agreements with any of these employees and do not expect to do so in the foreseeable future. Our success depends, significantly, on our ability to continue to attract such personnel. We cannot assure that we will be able to retain our existing personnel or attract additional qualified persons when required and on acceptable terms.

Our business may be subject to product liability claims.

The manufacturing and distribution of our products involve an inherent risk of product liability claims being asserted against us. Regardless of whether we are ultimately determined to be liable or our products are determined to be defective, we might incur significant legal expenses not covered by insurance. In addition, product liability litigation could damage our reputation and impair our ability to market our products, regardless of the outcome. Litigation could also impair our ability to retain product liability insurance or make our insurance more expensive. Although we currently maintain liability insurance, we cannot assure that we will be able to continue to obtain such insurance on acceptable terms, or that such insurance will provide adequate coverage against all potential claims. If we are subject to an uninsured or inadequately insured product liability claim, our business, financial condition and results of operations could be adversely affected.

Market prices for securities of technology companies are highly volatile.

The market prices for securities of technology companies have been volatile in the past and could continue to be volatile in the future. Fluctuations in our financial performance from period to period could have a significant impact on the market price of our common shares.

Our international operations are subject to different product standards as well as other operational risks.

In fiscal 2019, sales to customers outside of the U.S. accounted for 40.1% of our total revenue. We expect that our international business will continue to account for a significant portion of our total sales. Foreign regulatory bodies may establish product standards different from those in the U.S. and with which our current products do not comply. Our potential inability to design products that comply with foreign standards could have a material adverse effect on our future growth. Other risks related to sales to customers outside of the U.S. include possible disruptions in transportation, difficulties in building and managing foreign distribution, fluctuation in the value of foreign currencies, changes in import duties and quotas and unexpected economic and political changes in foreign markets. These factors could negatively impact our competitiveness in these markets or otherwise adversely impact our business results or financial condition. Moreover, discriminatory or conflicting fiscal or trade policies in different countries, including potential changes to tariffs and existing trade policies and agreements, could adversely affect our results.

Changing political conditions could adversely impact our business and financial results.

Changes in the political conditions in markets in which we manufacture, sell or distribute our products may be difficult to predict and may adversely affect our business and financial results. For example, the U.K.'s decision to leave the European Union has created uncertainty regarding, among other things, the U.K.'s future legal and economic framework and how the U.K. will interact with other countries, including with respect to the free movement of goods, services, capital and people. In addition, results of elections, referendums or other political processes in certain markets in which our products are manufactured, sold or distributed could create uncertainty regarding how existing governmental policies, laws and regulations may change, including with respect to sanctions, taxes, the movement of goods, services, capital and people between countries and other matters. The potential implications of such uncertainty, which include, among others, exchange rate fluctuations, trade barriers and market contraction, could adversely affect the Company's business and financial results.

Tax legislation could materially adversely affect our financial results and tax liabilities.

We are subject to the tax laws and regulations of the U.S., including state and local governments, as well as foreign jurisdictions. Legislation may be enacted that could materially adversely affect our financial results. There can be no assurance that our effective tax rate will not be adversely affected by legislation.

Our tax expense and liabilities may also be affected by other factors, such as changes in our business operations, acquisitions, investments, entry into new businesses and geographies, intercompany transactions, the relative amount of our foreign earnings, losses incurred in jurisdictions for which we are not able to realize related tax benefits, changes in our stock price, and changes in our deferred tax assets and liabilities and their valuation. In addition, tax laws and regulations are extremely complex and subject to varying interpretations. For example, the legislation known as the U.S. Tax Cuts and Jobs Act of 2017 (the "U.S. Tax Act") requires complex computations to be performed that were not previously required by U.S. tax law, significant judgments to be made in interpretation of the provision of the U.S. Tax Act, significant estimates in calculations, and the preparation and analysis of information not previously relevant or regularly produced. The U.S. Treasury Department, the IRS, and other standard-setting bodies will continue to interpret or issue guidance on how provisions of the U.S. Tax Act will be applied or otherwise administered. As future guidance is issued, we may make adjustments to amounts that we have previously recorded that may materially impact our financial statements in the period in which the adjustments are made.

Although we believe that our historical tax positions are sound and consistent with applicable laws, regulations and existing precedent, there can be no assurance that our tax positions will not be challenged by relevant tax authorities or that we would be successful in any such challenge. Additionally, we operate in multiple income tax jurisdictions and must determine the appropriate allocation of income to each of these jurisdictions based on current interpretations of complex income tax regulations. Income tax audits associated with the allocation of income and other complex issues may result in significant income tax adjustments that could negatively impact our future operating results.

ITEM 1B. UNRESOLVED STAFF COMMENTS – NONE

ITEM 2. PROPERTIES

Principal Manufacturing, Distribution and Administrative locations

Location	Approximate Square Feet	Operations	Ownership
Lansing, Michigan	300,000	Corporate, Food Safety, Animal Safety	Owned
Lexington, Kentucky	210,000	Animal Safety	Owned
Kenansville, North Carolina	33,500	Animal Safety	Leased, expires 3/2020
St Joseph, Michigan	7,000	Animal Safety	Leased, expires 5/2021
Randolph, Wisconsin	137,000	Animal Safety	Owned
Pleasantville, Iowa	59,000	Animal Safety	Leased, expires 12/2020
Lincoln, Nebraska	41,000	Animal Safety	Owned
Memphis, Tennessee	66,100	Animal Safety	Owned
Turlock, California	29,500	Animal Safety	Leased, expires 9/2022
Edmonton, Alberta, Canada	2,000	Animal Safety	Leased, month to month
Ayr, Scotland, United Kingdom	74,000	Food Safety	Owned
Heywood, England, United Kingdom	26,800	Food Safety	Owned
Rochdale, England, United Kingdom	60,000	Food Safety	Owned
Indaiatuba, Brazil	6,800	Food Safety	Leased, expires 5/2021
Pindamonhangaba, Brazil	76,000	Food Safety	Owned
Naucalpan, Mexico	27,000	Food Safety	Leased, expires 10/2021
Shanghai, China	7,900	Food Safety	Leased, expires 10/2021
Kochi, India	5,500	Food Safety	Leased, expires 4/2020
Gatton, Australia	4,600	Animal Safety	Leased, expires 1/2023

Our corporate headquarters are located in Lansing, Michigan, with administrative, sales, manufacturing and warehousing in other locations domestically and globally. These properties are in good condition, well-maintained, and generally suitable and adequate to support our business.

ITEM 3. LEGAL PROCEEDINGS

Neogen is subject to certain legal proceedings in the normal course of business that, in the opinion of management, should not have a material effect on our future results of operations or financial position.

ITEM 4. MINE SAFETY DISCLOSURES — NOT APPLICABLE

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Neogen Common Stock is traded on the NASDAQ Global Select Market under the symbol NEOG.

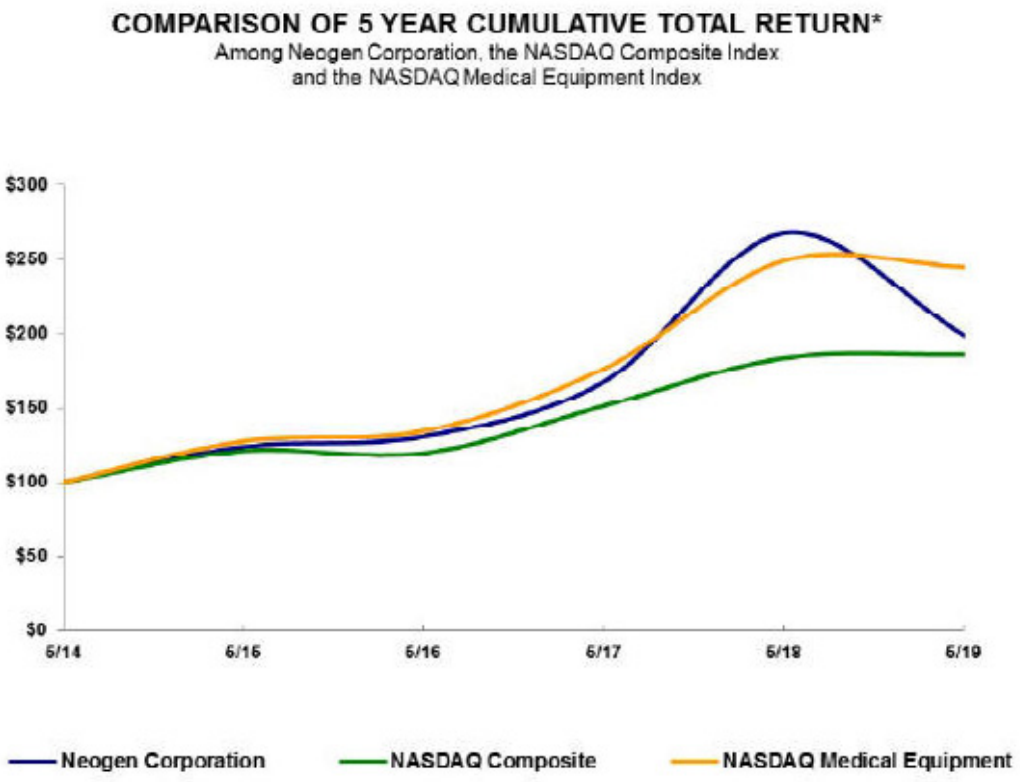
Holders

As of June 30, 2019, there were approximately 249 stockholders of record of Common Stock and management believes there are a total of approximately 10,000 beneficial holders.

Dividends

Neogen has never paid cash dividends on its Common Stock and does not anticipate paying cash dividends in the foreseeable future.

The graph below matches Neogen Corporation's cumulative 5-Year total shareholder return on common stock with the cumulative total returns of the NASDAQ Composite index and the NASDAQ Medical Equipment index. The graph tracks the performance of a $100 investment in our common stock and in each index (with the reinvestment of all dividends) from 5/31/2014 to 5/31/2019.



	5/14	5/15	5/16	5/17	5/18	5/19
Neogen Corporation	**100.00**	**123.68**	**130.64**	**167.48**	**267.13**	**198.82**
NASDAQ Composite	**100.00**	**120.89**	**119.47**	**151.43**	**183.75**	**186.02**
NASDAQ Medical Equipment	**100.00**	**127.63**	**134.41**	**176.32**	**249.17**	**244.73**

The stock price performance included in this graph is not necessarily indicative of future stock price performance.

ITEM 6. SELECTED FINANCIAL DATA

The following tables set forth selected consolidated financial data of Neogen for the year ended May 31, 2019, and each of the four preceding fiscal years. The selected consolidated financial data presented below have been derived from our consolidated financial statements. This financial data should be read in conjunction with the consolidated financial statements, related notes and other financial information appearing elsewhere in this Form 10-K.

	Years Ended May 31				
	2019	2018	2017	2016	2015
(in thousands, except per share data)					
Income Statement Data:					
Food Safety Revenues	$213,474	$194,477	$170,034	$145,057	$129,876
Animal Safety Revenues	200,712	203,453	188,243	172,172	150,025
Total Revenues	414,186	397,930	358,277	317,229	279,901
Total Cost of Revenues	222,266	211,658	189,353	167,898	143,113
Gross Margin	191,920	186,272	168,924	149,331	136,788
Sales and Marketing	70,230	66,929	59,380	53,866	48,860
General and Administrative	40,791	38,294	34,214	29,189	25,233
Research and Development	12,805	10,855	10,385	9,890	9,577
Operating Income	68,094	70,194	64,945	56,386	53,118
Other Income (Expense)	4,865	3,271	1,728	(873)	(1,042)
Income Before Income Taxes	72,959	73,465	66,673	55,513	52,076
Provision for Income Taxes	12,783	10,250	22,700	18,975	18,500
Net Income	60,176	63,215	43,973	36,538	33,576
Net (Income) Loss Attributable to Non-controlling Interest	—	(70)	(180)	26	(50)
Net Income Attributable to Neogen	$ 60,176	$ 63,145	$ 43,793	$ 36,564	$ 33,526
Net Income per Share (basic) (1)	$ 1.16	$ 1.23	$ 0.87	$ 0.73	$ 0.68
Net Income per Share (diluted) (1)	$ 1.15	$ 1.21	$ 0.86	$ 0.72	$ 0.67
Weighted Average Shares Outstanding (diluted) (1)	52,425	52,149	51,165	50,500	49,926

	Years Ended May 31				
	2019	2018	2017	2016	2015
Balance Sheet Data:					
Cash and Cash Equivalents and Marketable Securities	$267,524	$210,810	$143,635	$107,796	$114,164
Working Capital (2)	411,278	337,101	256,959	219,628	205,739
Total Assets	695,740	618,009	528,409	449,940	392,181
Long-Term Debt	—	—	—	—	—
Total Equity	637,899	560,175	471,757	404,161	350,963

(1) On December 29, 2017, the Company effected a 4-for-3 stock split whereby shareholders of record on December 18, 2017 received a dividend of one additional share of stock for each three shares held. All share and per share amounts in this Form 10-K have been adjusted to reflect the stock split as if it had taken place at the beginning of the period presented.

(2) Defined as current assets less current liabilities.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The information in this Management's Discussion and Analysis of Financial Condition and Results of Operations contains both historical financial information and forward-looking statements. Neogen's management does not provide forecasts of future financial performance. While we are optimistic about our long-term prospects, historical financial information may not be indicative of our future financial results.

Any statements contained herein that are not statements of historical fact may be deemed to be forward-looking statements. Without limiting the foregoing, the words "believes," "anticipates," "plans," "expects," "seeks," "estimates," and similar expressions are intended to identify forward-looking statements. There are a number of important factors, including competition, recruitment and dependence on key employees, impact of weather on agriculture and food production, identification and integration of acquisitions, research and development risks, patent and trade secret protection, government regulation and other risks detailed in item 1A. RISK FACTORS in this Form 10-K and from time to time in the Company's reports on file at the Securities and Exchange Commission, that could cause Neogen Corporation's results to differ materially from those indicated by such forward-looking statements, including those detailed in this "Management's Discussion and Analysis of Financial Condition and Results of Operations."

In addition, any forward-looking statements represent management's views only as of the day this Form 10-K was first filed with the Securities and Exchange Commission and should not be relied upon as representing management's views as of any subsequent date. While we may elect to update forward-looking statements at some point in the future, we specifically disclaim any obligation to do so, even if our views change.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

The discussion and analysis of our financial condition and results of operations are based on the consolidated financial statements that have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires that management make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, management evaluates the estimates, including but not limited to, those related to receivable allowances, inventories and intangible assets. These estimates are based on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

The following critical accounting policies reflect management's more significant judgments and estimates used in the preparation of the consolidated financial statements.

Revenue Recognition

In May 2014, the FASB issued ASU No. 2014-09—Revenue from Contracts with Customers (Topic 606). The new standard outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The core principle of the revenue model is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The standard is designed to create greater comparability for financial statement users across industries and jurisdictions and also requires enhanced disclosures. In April 2016, the FASB issued Accounting Standards Update No. 2016-10— Revenue from Contracts with Customers (Topic 606), which amends and adds clarity to certain aspects of the guidance set forth in ASU 2014-09 related to identifying performance obligations and licensing. The guidance became effective for the Company on June 1, 2018. We adopted this standard using the full retrospective approach. This approach was chosen to provide appropriate comparisons against our prior year financial statements; accordingly, historical information for the years ended May 31, 2018 and 2017 has been adjusted to conform to the new standard. See Revenue Recognition section of Note 1 to the consolidated financial statements for further discussion.

Accounts Receivable Allowance

Management attempts to minimize credit risk by reviewing customers' credit history before extending credit and by monitoring credit exposure on a regular basis. An allowance for doubtful accounts receivable is established based upon factors surrounding the credit risk of specific customers, historical trends and other information. Collateral or other security is generally not required for accounts receivable. Once a receivable balance has been determined to be uncollectible, that amount is charged against the allowance for doubtful accounts.

Inventory

A reserve for obsolete and slow-moving inventory has been established and is reviewed at least quarterly based on an analysis of the inventory, considering the current condition of the asset as well as other known facts and future plans. The reserve required to record inventory at lower of cost or net realizable value may be adjusted as conditions change. Product obsolescence may be caused by shelf-life expiration, discontinuance of a product line, replacement products in the marketplace or other competitive situations.

Goodwill and Other Intangible Assets

Goodwill represents the excess purchase price over fair value of tangible net assets of acquired businesses after amounts are allocated to other identifiable intangible assets. Other intangible assets include customer relationships, trademarks, licenses, trade names, covenants not-to-compete and patents. Customer relationship intangibles are amortized on either an accelerated or straight-line basis, reflecting the pattern in which the economic benefits are consumed, while all other amortizable intangibles are amortized on a straight-line basis; intangibles are generally amortized over 5 to 25 years. We review the carrying amounts of goodwill and other non-amortizable intangible assets annually, or when indications of impairment exist, to determine if such assets may be impaired by performing a quantitative assessment. If the carrying amounts of these assets are deemed to be less than fair value based upon a discounted cash flow analysis and comparison to comparable EBITDA multiples of peer companies, such assets are reduced to their estimated fair value and a charge is made to operations.

Long-lived Assets

Management reviews the carrying values of its long-lived assets to be held and used, including definite-lived intangible assets, for possible impairment whenever events or changes in business conditions warrant such a review. The carrying value of a long-lived asset is considered impaired when the anticipated separately identifiable undiscounted cash flows over the remaining useful life of the asset indicate that the carrying amount of the asset may not be recoverable. In such an event, fair value is determined using discounted cash flows and, if lower than the carrying value, impairment is recognized through a charge to operations.

Equity Compensation Plans

Share options awarded to employees and shares of stock awarded to employees under certain stock purchase plans are recognized as compensation expense based on their fair value at grant date. The fair market value of options granted under our stock option plans was estimated on the date of grant using the Black-Scholes option pricing model with assumptions for inputs such as interest rates, expected dividends, volatility measures and specific employee exercise behavior patterns based on statistical data. Some of the inputs used are not market-observable and have to be estimated or derived from available data. Use of different estimates may produce different option values, which in turn may result in higher or lower compensation expense recognized.

To value options, several recognized valuation models exist. None of these models can be singled out as being the best or most correct one. The model applied by us can handle most of the specific features included in the options granted, which is the reason for its use. If a different model were used, the option values could differ despite using the same inputs. Accordingly, using different assumptions coupled with using a different valuation model could have a significant impact on the fair value of employee stock options. Fair value could be either higher or lower than the number provided by the model applied and the inputs used. Further information on our equity compensation plans, including inputs used to determine the fair value of options, is disclosed in Notes 1 and 5 to the consolidated financial statements.

Income Taxes

We account for income taxes using the asset and liability method. Under this method, deferred income tax assets and liabilities are determined based on differences between the financial reporting and tax bases of assets and liabilities and for tax credit carryforwards and are measured using the enacted tax rates in effect for the years in which the differences are expected to reverse. Deferred income tax expense represents the change in net deferred income tax assets and liabilities during the year.

Our wholly-owned foreign subsidiaries are comprised of Neogen Europe, Lab M Holdings, Quat-Chem, Neogen do Brasil, Rogama Industria e Comercio Ltda, Neogen Latinoamérica, Neogen Bio-Scientific Technology Co (Shanghai), Neogen Food and Animal Security (India), Neogen Canada, and Neogen Australasia Pty Limited. Based on historical experience, as well as our future plans, earnings from these subsidiaries are expected to be re-invested indefinitely for future expansion and working capital needs. Furthermore, our domestic operations have historically produced sufficient operating cash flow to mitigate the need to remit foreign earnings. On an annual basis, we evaluate the current business environment and whether any new events or other external changes might require a re-evaluation of the decision to indefinitely re-invest foreign earnings. At May 31, 2019, unremitted earnings of our foreign subsidiaries were $55,553,000.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (U.S. Tax Act) was signed into law making significant changes to the Internal Revenue Code. Changes include a federal corporate tax rate reduced from 35% to 21% for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial system, and a one-time transition tax on the mandatory deemed repatriation of foreign earnings. The U. S. Tax Act also includes a provision to tax global intangible low-taxed income (GILTI) of foreign subsidiaries and a deduction for foreign derived intangible income (FDII), both of which became effective for us beginning June 1, 2018. See Note 6 to the consolidated financial statements for further information.

RESULTS OF OPERATIONS

Executive Overview

- Consolidated revenues were $414.2 million in fiscal 2019, an increase of 4% compared to $397.9 million in fiscal 2018. Organic sales increased 3%.
- Food Safety segment sales were $213.5 million in fiscal 2019, an increase of 10% compared to $194.5 million in fiscal 2018. Organic sales increased 9%, with the acquisition of Clarus Labs, in August 2018, contributing the remainder of the growth.
- Animal Safety segment sales were $200.7 million in fiscal 2019, a decrease of 1% compared to $203.5 million in fiscal 2018. Organic sales decreased 2%, with the acquisitions of Neogen Australasia (September 2017), Livestock Genetic Services (September 2018) and Delta Genomics (January 2019) partially offsetting the decrease.
- International sales were 40.1% of total sales in fiscal 2019 compared to 37.6% of total sales in fiscal 2018.
- Our effective tax rate was 17.5% in fiscal 2019 compared to an effective tax rate of 14.0% in fiscal 2018.
- Net income was $60.2 million, or $1.15 per diluted share, a decrease of 5% compared to $63.1 million, or $1.21 per share, in the prior year.
- Cash generated from operating activities in fiscal 2019 was $63.8 million, compared to $69.1 million in fiscal 2018.

Neogen's results reflect an 11% increase in international sales in fiscal 2019 compared to the prior year. We continue to focus on increasing our presence and market share throughout the world, while also integrating recent international acquisitions into our product portfolio. Sales increases for fiscal 2019 compared to the prior year are as follows for each of our international locations:

	Revenue % Increase USD	Revenue % Increase Local Currency
Neogen Europe (including Lab M & Quat-Chem)	8%	12%
Neogen do Brasil (including Deoxi & Rogama)	16%	36%
Neogen Latinoamerica	13%	17%
Neogen China	13%	17%
Neogen India	71%	86%
Neogen Australasia	122%	150%
Neogen Canada	(11)%	(7)%

Currency translation had a negative impact of approximately $8.0 million on revenues recorded in foreign currencies during fiscal 2019, as the U.S. dollar strengthened against all the currencies in the countries in which we conduct business. The revenue increase in Europe was led by a 14% increase in sales of genomics services, primarily in the porcine and bovine markets. Deoxynivalenol (DON) test kit sales also increased 19% due to increased testing after a DON outbreak in France's wheat crops in the fall of calendar 2018. Sales at Quat-Chem increased 17%, due to increased sales coverage and the introduction of new products into their markets.

After adjusting for a 15% devaluation of the real against the dollar, sales in Brazil increased 16%, led by a 90% increase in sales of natural toxins test kits, as we gained significant new business from customers testing for the presence of aflatoxin in corn. Sales of forensic test kits, used for required drug testing of commercial drivers in Brazil, increased significantly due to business that shifted from U.S. labs to labs in Brazil and increased demand from commercial laboratories located in Brazil. Neogen Latinoamerica grew revenues by 13%, with gains across most product lines, in particular mycotoxins and culture media, and increased sales in both Mexico and Central America.

Service revenue, which consists primarily of genomics services to animal protein and companion animal markets, was $74.7 million in fiscal 2019, an increase of 12% over prior fiscal year sales of $66.6 million, aided by the acquisitions of Neogen Australasia (September 2017), Livestock Genetics (September 2018) and Delta Genomics (January 2019); organic sales of service revenue increased 9%. The growth was led by increases in sample volumes from the global beef and companion animal markets and porcine and bovine markets in Europe.

REVENUES

(dollars in thousands)	Year Ended May 31, 2019	Increase/ (Decrease)	May 31, 2018	Increase/ (Decrease)	May 31, 2017
Food Safety:					
Natural Toxins, Allergens & Drug Residues	$ 78,373	7%	$ 72,962	3%	$ 70,926
Bacterial & General Sanitation	41,966	10%	38,156	10%	34,706
Culture Media & Other	49,857	13%	44,271	12%	39,367
Rodenticides, Insecticides & Disinfectants	25,584	7%	23,821	75%	13,620
Genomics Services	17,694	16%	15,267	34%	11,415
	213,474	10%	194,477	14%	170,034
Animal Safety:					
Life Sciences	7,858	(25)%	10,411	7%	9,704
Veterinary Instruments & Disposables	44,582	(7)%	47,749	15%	41,693
Animal Care & Other	29,941	(3)%	30,930	11%	27,891
Rodenticides, Insecticides & Disinfectants	66,389	(2)%	67,646	(3)%	69,429
Genomics Services	51,942	11%	46,717	18%	39,526
	200,712	(1)%	203,453	8%	188,243
Total Revenue	$ 414,186	4%	$ 397,930	11%	$ 358,277

Year Ended May 31, 2019 Compared to Year Ended May 31, 2018

Food Safety:

Natural Toxins, Allergens & Drug Residues – Sales in this category increased 7% in fiscal 2019 compared to the prior year. For the natural toxins and allergens product lines, test kit sales increased 15% and 7%, respectively, for the year. The natural toxin increase was due to new business earned in Brazil for aflatoxin test kits, and higher sales of deoxynivalenol (DON) test kits in the U.S. and France, the result of mild outbreaks. These increases were partially offset by a 5% decrease in sales of drug residues test kits, due to lower demand in Europe.

Bacterial & General Sanitation – Sales in this category increased 10% in fiscal 2019 compared to the prior year. Sales of test kits to detect pathogens increased 24%, as we continued to gain new business with our *Listeria* Right Now test kit that launched in fiscal 2018. Sales of our AccuPoint sanitation monitoring product line increased 11%, with samplers up 13%, as we increased our market share. Sales of products to detect spoilage organisms in foods increased 3%.

Culture Media & Other – Sales in this category increased 13% in fiscal 2019 compared to fiscal 2018. Sales of Neogen Culture Media, formerly marketed as the Acumedia and Lab M brands, increased 7%, aided in part by the August 2018 acquisition of Clarus Labs, which consists of the Colitag product and reports in the culture media product line. Excluding new business from the acquisition, sales in the Neogen Culture Media product line increased 4%. This category also includes forensic test kits sold within Brazil, which increased significantly as business shifted from labs in the U.S. in the prior year (reported in the Animal Safety segment) to labs in Brazil and increased demand from commercial laboratories in that country.

Rodenticides, Insecticides & Disinfectants – Revenues of products in this category sold through our Food Safety operations increased 7% in fiscal 2019. This category was led by increases in sales of cleaners and disinfectants to customers in Europe, China and India, partially offset by lower sales of insecticides in Brazil due to a large government tender in fiscal 2018 which did not recur in fiscal 2019.

Genomics Services – Sales of genomics services sold through our Food Safety operations increased 16% in fiscal 2019 compared to the same period in the prior year, primarily due to higher sales in the European porcine and bovine markets. We also benefitted from a large, non-recurring research project with the Brazilian government, and the commercialization of a new service offering for a type of cattle specific to the Brazilian market.

Animal Safety:

A high proportion of the Animal Safety products are marketed and sold through our veterinary distributor network; this channel was soft in 2019, with sluggish end market demand, caused in part by increased tariffs and political uncertainties in our markets. We were also negatively impacted by inventory destocking at our largest distributor partners.

Life Sciences – Sales in this category decreased 25% in fiscal 2019 compared to the same period in the prior year, as approximately $2.4 million of forensic test kit revenues shifted to our operations in Brazil, which are reported in the Food Safety segment. This testing was performed by commercial labs in the U.S. in the prior fiscal year, but has since moved to commercial labs located in Brazil.

Veterinary Instruments & Disposables – Revenues in this category decreased 7% in fiscal 2019 compared to fiscal 2018. Protective wear and consumables decreased 17%, resulting from poor economic conditions in the commercial dairy production market. Veterinary instruments sales were down 4% for the year, however, this product line had a very strong increase in fiscal 2018, with sales up 23% in that period compared to the prior year. A 19% decline in detectable needles was partially offset by strong increases in disposable syringes and aluminum and poly hub needles.

Animal Care & Other – Sales of these products decreased 3% in fiscal 2019. Wound care and injectable vitamin products were down 13% and 6%, respectively, due to inventory destocking at distributors; dairy supplies that we distribute were down 5%, due to poor economic conditions in the commercial dairy production market. Additionally, we spent more on promotional programs and rebates with distributors, which are recorded as contra revenues within this category, in fiscal 2019 than in the prior year. Partially offsetting these losses were a 12% increase in sales of our biologics product line, and a 7% increase in supplements and other care products, both due to increased demand from end customers in the companion animal and equine markets.

Rodenticides, Insecticides & Disinfectants – Sales in this category decreased 2% in fiscal 2019, compared to the same period in the prior year. The decrease was due primarily to the full year impact of toll manufacturing business lost in the third quarter of fiscal year 2018. Additionally, rodenticide sales declined due to poor weather conditions causing lower demand and a weak U.S. animal protein market partially caused by tariff issues.

Genomics Services – Sales in this category increased 11% in fiscal 2019, aided by the acquisitions of Neogen Australasia (September 2017), Livestock Genetics (September 2018) and Delta Genomics (January 2019); organic growth in this category was 7%. Strong growth in the beef cattle and companion animal markets was partially offset by revenue decreases in U.S. poultry and porcine markets, despite increases in sample volumes, resulting from a shift to lower priced chips and services. Additionally, poor economic conditions in the U. S. commercial dairy production market resulted in lower revenues from that market.

Year Ended May 31, 2018 Compared to Year Ended May 31, 2017

Food Safety:

Natural Toxins, Allergens & Drug Residues – Sales in this category increased 3% in fiscal 2018 compared to the prior year. For the allergens and dairy drug residues product lines, test kit sales increased 12% and 13%, respectively, for the year. These increases were partially offset by a 26% decrease in sales of deoxynivalenol (DON) test kits, as prior year outbreaks of DON in corn crops in the U.S., Canada and Europe did not recur in fiscal 2018.

Bacterial & General Sanitation – Sales in this category increased 10% in fiscal 2018, led by strong sales of our AccuPoint sanitation monitoring product line which increased 18% on strength in both reader equipment and consumable supplies. Sales of test kits to detect pathogens increased 16%, led by growth in *Listeria* products, including our new *Listeria* Right Now test kit that launched earlier in the fiscal year. Additionally, sales of our product line to detect spoilage organisms in processed foods increased 2%.

Culture Media & Other – Sales in this category increased 12% in fiscal 2018 compared to fiscal 2017. Sales of Neogen Culture Media, formerly marketed as the Acumedia and Lab M brands, increased 19%, due to continued strength in products manufactured at Lab M in the U.K. and a large non-recurring order from a U.S. customer. This category also includes sales of forensic test kits sold through our Brazilian subsidiary, which decreased by 39% in fiscal 2018. Demand in fiscal 2017 was extremely high, due to a new requirement for drug testing of commercial truck drivers, however, sales of these kits in Brazil have decreased in fiscal 2018 due to increased competition and customer losses caused by conversion to different testing methods.

Rodenticides, Insecticides & Disinfectants – Sales of products in this category sold through our Food Safety operations increased 75% in fiscal 2018; excluding the December 2016 acquisitions of Quat-Chem and Rogama, organic growth was 2%. The increase was primarily due to a nonrecurring large sale of insecticides by Rogama to a government health organization. Cleaner and disinfectants sold through Food Safety operations were negatively impacted by termination of a distribution agreement in January 2017, which resulted in a decline in sales for those distributed products of $859,000 in fiscal 2018.

Genomics Services – Sales of genomics services sold through our Food Safety operations increased 34% in fiscal 2018 compared to the same period in the prior year, primarily due to market share increases, particularly in the beef and dairy cattle markets, and incremental business with a large poultry producer, in Europe.

Animal Safety:

Life Sciences – Sales in this category increased 7% in fiscal 2018 compared to fiscal 2017, due to increased volumes of forensic test kits sold to commercial labs in the U.S.

Veterinary Instruments & Disposables – Revenues in this category increased 15% in fiscal 2018, led by a 20% increase in sales of syringes, as we gained new customers in the retail and custom solutions markets. Sales of our patented detectable needles increased 23%, aided by strong sales to customers in Europe, including Russia.

Animal Care & Other – Sales of these products increased 11% in fiscal 2018, due to higher sales of PanaKare, our pancreatic replacement therapy, which benefitted from competitor backorders in fiscal 2018. Additionally, results from fiscal 2017 included sales credits totaling $1.1 million in the first quarter as we removed our canine thyroid product from the market, after the FDA approved a new drug application for a competitive product.

Rodenticides, Insecticides & Disinfectants – Sales in this category decreased 3% in fiscal 2018, compared to the same period in the prior year. The January 2017 termination of a distribution agreement with a manufacturer of cleaners and disinfectants resulted in lost sales of those distributed products totaling $4.7 million within this category. Partially offsetting this loss, sales of rodenticides increased 11% due to market share gains in the U.S.

Genomics Services – Sales in this category increased 18% in fiscal 2018; excluding the September 2017 acquisition of Neogen Australasia, organic growth was 11%. The growth was led by increases in sales to the global beef and dairy cattle and companion animal markets and higher volumes from a large poultry customer.

COST OF REVENUES

(dollars in thousands)	2019	Increase	2018	Increase	2017
Cost of Revenues	$222,266	5%	$211,658	12%	$189,353

Cost of revenues increased 5% in fiscal 2019 and 12% in fiscal 2018 in comparison with the prior years. This compares with revenue increases of 4% in fiscal 2019 and 11% in fiscal 2018. Expressed as a percentage of sales, cost of revenues was 53.7%, 53.2% and 52.9% in fiscal years 2019, 2018 and 2017, respectively.

Fiscal 2019 – Both Food Safety and Animal Safety margins decreased in fiscal 2019, primarily due to a product mix shift towards lower margin products within each segment, and to a lesser extent, the strength of the U.S. dollar, which rose against all of the currencies in the countries in which we operate, and resulted in higher cost of sales in our international operations, which pay for their inventory in U. S. dollars. A higher overall proportion of Food Safety revenues, which have higher than average gross margins, partially offset the lower margins within each segment.

Fiscal 2018 – Improvements in Animal Safety gross margins, resulting from raw material cost reductions and favorable mix were offset by higher product costs in the Food Safety segment resulting from lower sales of our mycotoxin test kits, which have higher gross margins, and a change in mix caused by the Quat-Chem and Rogama acquisitions. These businesses have product lines with gross margins lower than the average gross margins in this segment. Depreciation expense, resulting from the investment of machinery and equipment at several manufacturing locations, increased $872,000 in fiscal 2018.

Food Safety Gross Margins:

Food Safety gross margins were 51.8%, 52.4% and 55.0% in fiscal years 2019, 2018 and 2017, respectively.

Fiscal 2019 – Food Safety gross margins decreased 60 basis points in fiscal 2019, primarily the result of a shift in product mix at our international operations; in fiscal 2019, these operations sold a higher proportion of lower margin traditional Animal Safety products such as cleaners and disinfectants. In addition, gross margins were also negatively impacted by the strength of the U.S. dollar relative to the international currencies in which we operate, particularly in Brazil, Europe, and Mexico, where the real, pound and peso declined in value against the U.S. dollar by 15%, 3%, and 4%, respectively. These international operations report through the Food Safety segment. Increases in higher margin product lines such as our diagnostic and forensic test kits partially offset these decreases.

Fiscal 2018 – Our fiscal 2018 results reflect the full year impact of lower gross margins from revenues contributed by the recent acquisitions of Quat-Chem and Rogama. Excluding these businesses, Food Safety gross margins would have been 330 basis points higher in fiscal 2018. Additionally, the decrease in sales of higher margin forensic test kits through our Brazilian subsidiary, due to increased competition, and lower sales of mycotoxin test kits, due to a DON outbreak in the prior year which did not recur in fiscal 2018, adversely impacted gross margins in this segment.

Animal Safety Gross Margins:

Animal Safety gross margins were 40.6%, 41.4% and 40.1% in fiscal years 2019, 2018 and 2017, respectively.

Fiscal 2019 – Animal Safety gross margins decreased 80 basis points in fiscal 2019, primarily the result of lower volumes in higher margin products such as diagnostics, animal care products, instruments and rodenticides. Forensic test kit revenues in Animal Safety declined as a large U.S. commercial laboratory transferred sample testing to its locations in Brazil, which we service through our Brazilian operation, reporting in the Food Safety segment. We also had strong growth in sales of genomics services in our Australian operations; gross margins in this operation are lower than historical Animal Safety margins due to higher chip costs and lack of scale. Partially offsetting these lower margins were increased margins in the U.S. genomics operations, based primarily on improved input costs and increased sales of higher margin services to the bovine and companion animal markets.

Fiscal 2018 – The improvement in gross margin percentage from fiscal 2017 to fiscal 2018 was primarily due to raw material cost reductions in our genomics business. We also benefitted from increased sales of forensic test kits and other higher margin products and decreased sales of lower margin distributed cleaners and disinfectants resulting from the termination of a distribution agreement in January 2017.

OPERATING EXPENSES

(dollars in thousands)	2019	Increase	2018	Increase	2017
Sales and Marketing	$ 70,230	5%	$ 66,929	13%	$ 59,380
General and Administrative	40,791	7%	38,294	12%	34,214
Research and Development	12,805	18%	10,855	5%	10,385
Total Operating Expense	$123,826	7%	$116,078	12%	$103,979

Overall operating expenses increased by 7% in fiscal 2019 and 12% in fiscal 2018, each compared to the prior year. These increases compare to revenue increases of 4% and 11%, respectively, in each comparative period.

Sales and Marketing:

Sales and marketing expenses increased by 5% in fiscal 2019 and 13% in fiscal 2018, each compared to the prior year. As a percentage of sales, sales and marketing expense was 17.0%, 16.8% and 16.6% in fiscal years 2019, 2018 and 2017, respectively.

Fiscal 2019 – Salaries and commissions increased by 4% in 2019, and drove the 5% increase in overall sales and marketing expenses; shipping expenses increased 11%, the result of higher rates and an increase in air shipments. Other increases were the result of higher trade show, exhibit and sponsorship costs, and provision for bad debts. Partially offsetting these increases were lower promotion and consulting expenses.

Fiscal 2018 – Salaries and commissions expense rose 9% in fiscal 2018, while travel expense increased 12%. Other significant increases include shipping expense, distributor support and promotion programs, federal and state product registrations and royalty expense. Approximately $1.2 million of the increase in sales and marketing expense resulted from the Quat-Chem, Rogama and Neogen Australasia acquisitions.

General and Administrative:

General and administrative expenses rose 7% in fiscal 2019 compared to fiscal 2018 and by 12% in fiscal 2018 compared to fiscal 2017. As a percentage of sales, general and administrative expense was 9.8%, 9.6% and 9.5% in fiscal years 2019, 2018 and 2017, respectively.

Fiscal 2019 – Higher salary and stock-based compensation costs were the primary drivers of the overall 7% expense increase. In addition, higher depreciation and license fees on IT-related hardware and software investments, increased training, recruiting and legal fees contributed to the increased expense. These increases were somewhat offset by a $427,000 reduction in amortization expense, as certain intangible assets from past acquisitions were fully amortized during the year.

Fiscal 2018 – The 12% increase was primarily the result of higher salaries, due to additional headcount as well as compensation increases. Higher legal and professional fees and additional amortization of intangible assets, due to our recent acquisitions, also contributed to the increase compared to fiscal 2017.

Research and Development:

Research and development expenses increased 18% in fiscal 2019 and 5% in fiscal 2018, each compared to the prior year. As a percentage of revenue, these expenses were 3.1% in fiscal year 2019, 2.7% in fiscal year 2018 and 2.9% in fiscal year 2017; we expect to spend approximately 3% of total revenue on research and development annually.

Fiscal 2019 – The 18% increase in research and development expenses in fiscal 2019 was primarily the result of development spending for next generation products, and increases in expenditures to obtain regulatory approvals for a number of new products. Higher salaries expense, resulting from increased headcount and compensation increases, and increased depreciation expense, resulting from investments in analytical and testing equipment, accounted for the remainder of the increase.

Fiscal 2018 – In fiscal 2018, higher compensation costs were partially offset by lower levels of consulting and other outside services.

OPERATING INCOME

(dollars in thousands)	2019	Increase	2018	Increase	2017
Operating Income	$68,094	-3%	$70,194	8%	$64,945

Our operating income decreased by 3% in fiscal 2019 compared to fiscal 2018, and increased by 8% in fiscal 2018 compared to fiscal 2017. Expressed as a percentage of revenues, operating income was 16.4%, 17.6% and 18.1% in fiscal years 2018, 2017 and 2016, respectively.

The 3% decrease in operating income for fiscal 2019 was due primarily to overall operating expense increases of $7.7 million, up 7%, which compared to a gross margin increase of $5.6 million.

The 8% increase in operating income for fiscal 2018 was due to the 11% increase in sales, offset by slightly lower gross margins due to product mix shifts, and operating expenses which rose by 12% over fiscal 2017.

OTHER INCOME (EXPENSE)

Other Income (Expense) for the previous three fiscal years consisted of the following:

(dollars in thousands)	2019	2018	2017
Interest income (net of expense)	$ 4,683	$2,043	$ 838
Foreign currency transactions	(1,279)	274	(40)
Royalty income	150	147	171
Licenses and insurance settlements	672	360	660
Quat-Chem contingent consideration	422	255	—
Deoxi contingent consideration	(10)	(42)	(14)
Neogen India contingent consideration	—	—	32
Other	227	234	81
Total Other Income (Expense)	$ 4,865	$3,271	$1,728

The increase in interest income in fiscal years 2019 and 2018, each compared to the prior year, is the result of higher cash balances and rising interest rates during the two-year period. The loss from foreign currency translations in fiscal 2019 is primarily the result of the changes in the value of foreign currencies relative to the U.S. dollar in countries in which we operate; the dollar strengthened against all of these currencies in 2019. In fiscal 2019 and 2018, gains were recognized on insurance proceeds received for property loss settlements; in fiscal 2017, we terminated a licensing agreement and recognized a gain of $660,000. Other Income in fiscal 2019 and 2018 included the adjustment of Quat-Chem and Deoxi contingent consideration based on the level of achievement of revenue targets for the acquired businesses in each of those fiscal years.

PROVISION FOR INCOME TAXES

(dollars in thousands)	2019	Increase	2018	Increase	2017
Provision for Income Taxes	$12,783	25%	$10,250	-55%	$22,700

Income tax expense for fiscal 2019 was $12.8 million, an effective tax rate of 17.5%, compared to income tax expense of $10.3 million in 2018, an effective tax rate of 14.0%. For fiscal 2017, income tax expense of $22.7 million represented an effective tax rate of 34.0%.

The U.S. Tax Act reduced the statutory income tax rate from 35% to 21% in December 2017. During fiscal 2019, we utilized the 21% statutory rate for the entire year to compute our income tax expense, whereas the statutory rate in fiscal 2018 was a blended rate of 29.2% and fiscal 2017 was calculated using the previous statutory rate of 35%.

Differences from the U. S. statutory rate to our effective rate are primarily due to provisions in the U.S. Tax Act and the exercise of stock options. Please refer to Note 6 to the consolidated financial statements for more information.

NET INCOME AND INCOME PER SHARE

(dollars in thousands-except per share data)	2019	Increase	2018	Increase	2017
Net Income Attributable to Neogen	$60,176	-5%	$63,145	44%	$43,793
Net Income Per Share-Basic	$ 1.16		$ 1.23		$ 0.87
Net Income Per Share-Diluted	$ 1.15		$ 1.21		$ 0.86

Net income decreased by 5% in fiscal 2019 as compared to fiscal 2018. This is due to the increase in our effective tax rate in fiscal 2019 and, to a lesser extent, a 1% decrease in pre-tax income.

Net income increased by 44% in fiscal 2018, significantly aided by U.S. tax reform enacted in December 2017 and a change in accounting for stock-based compensation.

FUTURE OPERATING RESULTS

Neogen Corporation's future operating results involve a number of risks and uncertainties. Actual events or results may differ materially from those discussed in this report. Factors that could cause or contribute to such differences include, but are not limited to, the factors discussed below as well as those discussed elsewhere in this report. Management's ability to grow the business in the future depends upon our ability to successfully implement various strategies, including:

- developing, manufacturing and marketing new products with new features and capabilities, and having those new products successfully accepted in the marketplace;
- expanding our markets by fostering increased use of our products by customers;
- maintaining or increasing gross and net operating margins in changing cost environments;
- strengthening operations and sales and marketing activities in geographies outside of the U.S.;
- developing and implementing new technology development strategies; and
- identifying and completing acquisitions that enhance existing product categories or create new products or services.

FINANCIAL CONDITION AND LIQUIDITY

On May 31, 2019, we had $41.7 million in cash and cash equivalents, $225.8 million in marketable securities and working capital of $411.3 million. For the year ended May 31, 2019, cash generated from operating activities was $63.8 million, compared to $69.1 million generated in fiscal 2018; proceeds from stock option exercises provided an additional $17.0 million of cash. For the same period, additions to property and equipment were $14.7 million and business acquisitions used cash of $6.4 million. We have a financing agreement with a bank providing for an unsecured revolving line of credit of $15.0 million, which was amended in November 2018 to extend the expiration to September 30, 2021. There were no advances against this line of credit during fiscal years 2019, 2018 and 2017, and no balance outstanding at May 31, 2019 and 2018.

Accounts receivable at May 31, 2019 were $82.6 million, compared to $79.1 million at May 31, 2018; the increase is primarily due to the increase in revenues. Days sales outstanding, a measurement of the time it takes to collect receivables, was 61 days at May 31, 2019 compared to 60 days at May 31, 2018. All customer accounts are actively managed and no losses in excess of amounts reserved are currently expected.

Inventory balances were $86.0 million at May 31, 2019, an increase of $10.0 million, or 13%, compared to $76.0 million at May 31, 2018. During fiscal 2019, we increased inventory levels of products that are sold into our European markets, to enhance our ability to serve these markets in the event of a disorderly Brexit. While Brexit has been postponed to October 2019, we will continue to monitor and adjust our inventory levels as necessary. Excluding the impacts of the increase related to Brexit, inventory levels rose 8%. All operations are participating in programs to improve inventory turns in fiscal 2020, while ensuring adequate safety stocks to minimize backorders.

Neogen has been consistently profitable and has generated strong cash flow from operations during each of the past three fiscal years. However, our cash on hand and current borrowing capacity may not be sufficient to meet our cash requirements to commercialize products currently under development or our future plans to acquire additional businesses, technology and products that fit within our strategic plan. Accordingly, we may be required, or may choose, to issue equity securities or enter into other financing arrangements for a portion of our future capital needs.

We are subject to certain legal and other proceedings in the normal course of business that have not had, and, in the opinion of management, are not expected to have, a material effect on our results of operations or financial position.

CONTRACTUAL OBLIGATIONS

As of May 31, 2019, we have the following contractual obligations due by period:

(dollars in thousands)	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Long-Term Debt	$ —	$ —	$ —	$ —	$ —
Operating Leases	2,320	1,112	1,106	102	—
Unconditional Purchase Obligations (1)	54,583	50,410	3,231	934	8
	$56,903	$51,522	$ 4,337	$ 1,036	$ 8

(1) Unconditional purchase obligations are primarily purchase orders for future inventory and capital equipment purchases.

NEW ACCOUNTING PRONOUNCEMENTS

See discussion of any New Accounting Pronouncements in Note 1 to consolidated financial statements.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISKS

We have interest rate and foreign exchange rate risk exposure but no long-term fixed rate investments or borrowings. Our primary interest rate risk is due to potential fluctuations of interest rates for short-term investments.

Foreign exchange risk exposure arises because we market and sell our products throughout the world. Revenues in certain foreign countries as well as certain expenses related to those revenues are transacted in currencies other than the U.S. dollar. Our operating results are exposed to changes in exchange rates between the U.S. dollar and the British pound sterling, the euro, the Mexican peso, the Brazilian real, the Chinese yuan, the Australian dollar and to a lesser extent, the Indian rupee and the Canadian dollar; there is also exposure to a change in exchange rate between the British pound sterling and the euro. When the U.S. dollar weakens against foreign currencies, the dollar value of revenues denominated in foreign currencies increases. When the U.S. dollar strengthens, the opposite situation occurs. Additionally, previously invoiced amounts can be positively or negatively affected by changes in exchange rates in the course of collection. We use derivative financial instruments to help manage the economic impact of fluctuations in certain currency exchange rates. These contracts are adjusted to fair value through earnings.

Neogen has assets, liabilities and operations outside of the U.S., located in the United Kingdom, Brazil, Mexico, China, India, Canada and Australia where the functional currency is the British pound sterling, Brazilian real, Mexican peso, Chinese yuan, Indian rupee, Canadian dollar and Australian dollar, respectively, and also transacts business throughout Europe in the euro. Our investments in foreign subsidiaries are considered to be long-term. As discussed in ITEM 1A. RISK FACTORS, our financial condition and results of operations could be adversely affected by currency fluctuations.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTAL DATA

The response to this item is submitted in a separate section of this report starting on page F-1.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE—NONE

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

An evaluation was performed under the supervision and with the participation of our management, including the Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rule 13a-15 (e) under the Securities Exchange Act of 1934) as of May 31, 2019. Based on and as of the time of such evaluation, our management, including the Chief Executive Officer and Chief Financial Officer, concluded that our disclosure controls and procedures were effective as of the end of the period covered by this report to ensure that information required to be disclosed in the reports that are filed or submitted under the Securities and Exchange Act of 1934 is appropriately recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure the information required to be disclosed in the reports that are filed or submitted under the Securities Exchange Act of 1934 is accumulated and communicated to management, including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13-a-15(f) and 15d-15(f). Under the supervision and with the participation of our management, including the Chief Executive Officer and Chief Financial Officer, an evaluation was conducted as to the effectiveness of internal control over financial reporting as of May 31, 2019, based on the framework in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on that evaluation, management concluded that internal control over financial reporting was effective as of May 31, 2019. The effectiveness of internal control over financial reporting as of May 31, 2019 has been audited by BDO USA, LLP, an independent registered public accounting firm, as stated in its attestation report, which is included on the following page and is incorporated into this Item 9A by reference.

Changes in Internal Control over Financial Reporting

No changes in our internal control over financial reporting were identified as having occurred during the year ended May 31, 2019 that have materially affected, or are reasonably likely to materially affect, internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

Board of Directors and Stockholders
Neogen Corporation
Lansing, Michigan

Opinion on Internal Control over Financial Reporting

We have audited Neogen Corporation's (the "Company's") internal control over financial reporting as of May 31, 2019, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (the "COSO criteria"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of May 31, 2019, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets of the Company as of May 31, 2019 and 2018, the related consolidated statements of income, comprehensive income, equity, and cash flows for each of the three years in the period ended May 31, 2019, and the related notes and our report dated July 30, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying "Item 9A, Management's Report on Internal Control over Financial Reporting". Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit of internal control over financial reporting in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ BDO USA, LLP

Grand Rapids, Michigan
July 30, 2019

ITEM 9B. OTHER INFORMATION – NONE

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Information regarding the Company and certain corporate governance matters appearing under the captions "Election of Directors," "Audit Committee," and "Miscellaneous-Section 16(a) Beneficial Ownership Reporting Compliance" is incorporated by reference to Neogen's 2019 proxy statement to be filed within 120 days of May 31, 2019.

We have adopted a Code of Conduct that applies to our directors, officers and employees. This Code of Conduct is available on our website at http://www.neogen.com/pdf/CodeOfConduct.pdf.

Information About Our Executive Officers

The officers of Neogen are elected by and serve at the discretion of the Board of Directors. The names and titles of our officers as of May 31, 2019 are set forth below.

Name	Position with the Company	Year Joined the Company
John E. Adent	President & Chief Executive Officer	2017
Stewart W. Bauck, D.V.M., Ph.D.	Vice President, Agrigenomics	2012
Joseph A. Corbett	Vice President, Animal Safety Sales	1993
Robert S. Donofrio, Ph.D.	Vice President, Food Safety Research & Development	2016
Shane M. Fitzwater	Vice President, Animal Safety Operations	2018
Jerome L. Hagedorn	Vice President, Food Safety Operations	2018
James L. Herbert	Chairman of the Board	1982
Melissa K. Herbert	Vice President, Support Services	2005
Jason W. Lilly, Ph.D.	Vice President, International Business	2005
Terri A. Morrical	Vice President, Animal Safety	1992
Steven J. Quinlan	Vice President & Chief Financial Officer	2011

Melissa K. Herbert, Vice President, Support Services, is the daughter of James L. Herbert, Chairman of the Board.

Information concerning the officers of Neogen follows:

John E. Adent, age 51, joined Neogen as Chief Executive Officer on July 17, 2017. Prior to joining Neogen, Mr. Adent served as the Chief Executive Officer of Animal Health International, Inc., formerly known as Lextron, Inc., from 2004 to 2015, also serving as its President during that time. Animal Health International was sold to Patterson Companies, Inc. in 2015, and Mr. Adent served as the Chief Executive Officer of the $3.3 billion Animal Health Division of Patterson Animal Health from that period until his resignation on July 1, 2017. Mr. Adent began his career with management responsibilities for Ralston Purina Company, developing animal feed manufacturing and sales operations in China and the Philippines. When Ralston Purina spun off that business to Agribrands, he continued his management role in the European division in Spain and Hungary, serving as managing director of the Hungarian operations. He left Ralston Purina in 2004.

Dr. Stewart W. Bauck, age 61, joined Neogen in 2012 as our Director of Beef Cattle Genomics, and became General Manager of Neogen's genomics operation in Lincoln, NE in 2013. In December 2016, Dr. Bauck was named Neogen's Vice President of Agrigenomics, responsible for the operation and execution of our genomics strategy. Prior to joining Neogen, Bauck spent 15 years with Merial, Inc., where he created and launched the Igenity livestock production business. Igenity was acquired by Neogen from Merial in May 2012. Dr. Bauck's experience also includes various responsibilities in technical services and management for Merck AgVet, and earlier in his career, he owned and operated his own private veterinary practice with a major emphasis on food-producing animals.

Joseph A. Corbett, age 50, joined Neogen in December 1993 as a sales representative in the Animal Safety operation based in Lexington, Kentucky. Prior to Neogen, he worked for the Marriott Corporation in sales and operations. He has served in various sales, marketing and operational roles in the Neogen Animal Safety segment. He was named Vice President, Animal Safety Sales in October 2014, responsible for all Animal Safety revenues, excluding Genomics and Life Sciences.

Dr. Robert S. Donofrio, age 46, joined Neogen in February 2016 as Director of Microbiology Research and Development, and was promoted to Director of Food Safety Research and Development in December 2016. In April 2018, Dr. Donofrio was named Vice President of Food Safety Research and Development. Prior to joining Neogen, he worked for 15 years at NSF International in various positions including Director of Microbiology and Molecular Biology and Director of Applied Research. At Neogen, Dr. Donofrio is responsible for our food safety research activities in the U.S., Scotland and England.

Shane M. Fitzwater, age 45, joined Neogen in April 2018 as Vice President of Animal Safety Operations. In his role, Mr. Fitzwater is responsible for manufacturing, quality systems, supply chain, shipping and warehousing for our Animal Safety operations, excluding Genomics. Prior to joining Neogen, he spent 18 years in positions of increasing responsibility at Ecolab, Inc., including five years as Ecolab's Vice President of Supply Chain, Global Specialty Sector. Mr. Fitzwater managed Ecolab's global supply chain for a $750 million business unit with worldwide manufacturing and logistics operations. Before being named a vice president, he spent four years as a director of operations at Ecolab, managing a group of 450 employees and an annual operating budget of $40 million.

Jerome L. Hagedorn, age 53, joined Neogen in April 2018 as Vice President of Food Safety Operations. In the role, Mr. Hagedorn is responsible for the manufacturing, supply chain, shipping and warehousing, production engineering and quality systems for Neogen's Food Safety operations. Prior to joining Neogen, Mr. Hagedorn spent the past eight years as Vice President of Operations at Siemens Healthcare Diagnostics. At Siemens, he was responsible for multiple plant operations, including diagnostic instrument manufacturing and new product introduction. Prior to joining Siemens, Mr. Hagedorn held a variety of senior level positions over a 20 year career, including Director of Manufacturing at Bayer Healthcare in Indiana, Director of Lean Manufacturing at Invensys in Ohio, and Manager of Automated Manufacturing at Siemens Electronic Components in Mexico.

James L. Herbert, age 79, is Chairman of the Board of Directors and Director of Strategic Growth. He had been Chief Executive Officer and Executive Chairman of the Board since 2006; he resigned as Chief Executive Officer on July 17, 2017, when John Adent was named to that role, and from his role as Executive Chairman on January 29, 2019, when his executive responsibilities were transitioned to Mr. Adent. Prior to 2006, he had been President and a Director since he founded the Company in June 1982. Mr. Herbert previously held the position of Corporate Vice President of DeKalb Ag Research, a major agricultural genetics and energy company. He has management experience in animal biologics, specialized chemical research, medical instruments, aquaculture, animal nutrition, and poultry and livestock breeding and production.

Melissa K. Herbert, age 55, joined Neogen in August 2005 as a sales representative in our Food Safety Division in Lansing, Michigan. In 2011, Ms. Herbert was named Manager of Industry Affairs, with oversight of regulatory issues for both the Food and Animal Safety segments, and in June 2013, Director of Industry Affairs. She was named Vice President, Support Services in October 2015. Support Services is comprised of Technical Service, Regulatory Affairs and Industry Affairs departments.

Dr. Jason W. Lilly, age 45, joined Neogen in June 2005 as Market Development Manager for Food Safety. In June 2009, he moved to the Corporate Development group. He was named Vice President of Corporate Development in December 2011, responsible for the identification and acquisition of new business opportunities for the Company. In January 2019, Dr. Lilly was named Vice President of International Business, responsible for Neogen's operations outside of the U.S. and Canada. Prior to joining Neogen, he served in various technical sales and marketing roles at Invitrogen Corporation.

Terri A. Morrical, age 54, joined Neogen in September 1992 as part of our acquisition of WTT, Incorporated. She has directed most aspects of our Animal Safety operations since she joined Neogen and currently serves as Vice President responsible for the Animal Safety segment, excluding Genomics. From 1986 to 1991, Ms. Morrical was Controller for Freeze Point Cold Storage Systems and concurrently served in the same capacity for Powercore, Inc. In 1990, she joined WTT, Incorporated as VP/CFO and then became President, the position she held at the time Neogen acquired the business.

Steven J. Quinlan, age 56, joined Neogen in January 2011 as Vice President and Chief Financial Officer. He was named Secretary in October 2011. He is responsible for all internal and external financial reporting for Neogen, and manages the accounting, human resources and information technology departments. Mr. Quinlan came to Neogen following 19 years at Detrex Corporation (1992-2010), the last eight years serving as Vice President-Finance, CFO and Treasurer. He was on the audit staff at the public accounting firm Price Waterhouse (now PWC) from 1985-1989.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is incorporated by reference to Neogen's Proxy Statement to be filed within 120 days of May 31, 2019.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS, MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this Item is incorporated by reference to Neogen's Proxy Statement to be filed within 120 days of May 31, 2019.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this Item is incorporated by reference to Neogen's Proxy Statement to be filed within 120 days of May 31, 2019.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item is incorporated by reference to Neogen's Proxy Statement to be filed within 120 days of May 31, 2019.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) (1) and (2) and (c). The response to this portion of ITEM 15 is submitted as a separate section of this report starting on page F-1.

(a) (3). The Exhibits, listed on the accompanying Exhibit Index on page 40, are incorporated herein by reference.

ITEM 16. FORM 10-K SUMMARY — NONE

EXHIBIT INDEX

EXHIBIT NO.	DESCRIPTION
3.1	Restated Articles of Incorporation, as amended on November 20, 2018 (incorporated by reference to the exhibit filed with the Registrant's Quarterly Report on Form 10-Q filed December 28, 2018).
3.2	By-Laws, as amended (incorporated by reference to Exhibit 3.2 to the Registrant's Quarterly Report on Form 10-Q filed April 14, 2000).
10.1	Neogen Corporation 2007 Stock Option Plan as amended and restated (incorporated by reference to Exhibit A to the Registrant's 2011 Proxy Statement August 31, 2011 filed September 1, 2011).
10.2	Neogen Corporation 2015 Omnibus Incentive Plan (incorporated by reference to Appendix A to the Registrant's 2015 Proxy Statement dated and filed August 28, 2015).
10.3	Neogen Corporation 2018 Omnibus Incentive Plan (incorporated by reference to Appendix A to the Registrant's 2018 Proxy Statement dated and filed August 28, 2018).
10.4	Amended and Restated Credit Agreement dated as of November 30, 2018 between Registrant and JPMorgan Chase N.A. (incorporated by reference to Exhibit 10.A to the registrant's Form 8-K filed on December 6, 2018).
21	Listing of Subsidiaries
23	Consent of Independent Registered Public Accounting Firm BDO USA, LLP
24	Power of Attorney
31.1	Section 302 Certification of Principal Executive Officer
31.2	Section 302 Certification of Principal Financial Officer
32	Certification Pursuant to 18 U.S.C Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

NEOGEN CORPORATION

By: /s/ John E. Adent	By: /s/Steven J. Quinlan
John E. Adent, President & Chief Executive Officer (Principal Executive Officer)	Steven J. Quinlan, Vice President & Chief Financial Officer (Principal Financial Officer)

Dated: July 30, 2019

Pursuant to the requirements of the Securities Exchange Act of 1934, this Report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ John E. Adent John E. Adent	President & Chief Executive Officer (Principal Executive Officer)	July 30, 2019
/s/ Steven J. Quinlan Steven J. Quinlan	Vice President & Chief Financial Officer (Principal Financial Officer)	July 30, 2019
/s/ James L. Herbert James L. Herbert	Chairman of the Board	July 30, 2019
* William T. Boehm, Ph.D.	Director	
* James C. Borel	Director	
* Ronald D. Green, Ph.D.	Director	
* G. Bruce Papesh	Director	
* Jack C. Parnell	Director	
* Thomas H. Reed	Director	
* James P. Tobin	Director	
* Darci L. Vetter	Director	

*By: /s/ John E. Adent
John E. Adent, Attorney-in-fact July 30, 2019

ANNUAL REPORT ON FORM 10-K

ITEM 15 (a)(1)(2) (3), (b) and (c)

LIST OF FINANCIAL STATEMENTS, EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

YEAR ENDED MAY 31, 2019

NEOGEN CORPORATION

LANSING, MICHIGAN

FORM 10-K—ITEM 15(a)(1) AND (2) AND 15(c)

LIST OF FINANCIAL STATEMENTS AND FINANCIAL STATEMENT SCHEDULES

The following consolidated financial statements of Neogen Corporation and subsidiaries are included below and incorporated in ITEM 8:

Report of Independent Registered Public Accounting Firm

Consolidated Balance Sheets—May 31, 2019 and 2018

Consolidated Statements of Income—Years ended May 31, 2019, 2018 and 2017

Consolidated Statements of Comprehensive Income—Years ended May 31, 2019, 2018 and 2017

Consolidated Statements of Equity— Years ended May 31, 2019, 2018 and 2017

Consolidated Statements of Cash Flows— Years ended May 31, 2019, 2018 and 2017

Notes to Consolidated Financial Statements

Schedules for which provision is made in the applicable accounting regulation of the United States Securities and Exchange Commission are not required under the related instructions or are inapplicable and, therefore, have been omitted.

FORM 10-K – ITEM 15 (a) (3) AND (b)

A list of Exhibits required to be filed as a part of this report is set forth in the Exhibit Index, which immediately precedes the signature page, and is incorporated herein by reference.

Report of Independent Registered Public Accounting Firm

Board of Directors and Stockholders
Neogen Corporation
Lansing, Michigan

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Neogen Corporation (the "Company") and subsidiaries as of May 31, 2019 and 2018, the related consolidated statements of income, comprehensive income, equity, and cash flows for each of the three years in the period ended May 31, 2019, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at May 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended May 31, 2019**,** in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of May 31, 2019, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") and our report dated July 30, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ BDO USA, LLP

We have served as the Company's auditor since 2014.

Grand Rapids, Michigan
July 30, 2019

Neogen Corporation and Subsidiaries
Consolidated Balance Sheets – Assets
(in thousands)

	May 31	
	2019	2018
Assets		
Current Assets		
Cash and cash equivalents	$ 41,688	$ 83,074
Marketable securities	225,836	127,736
Accounts receivable, less allowance of $1,700 and $1,550 at May 31, 2019 and 2018, respectively	82,582	79,086
Inventories	85,992	76,005
Prepaid expenses and other current assets	13,431	9,888
Total Current Assets	449,529	375,789
Property and Equipment		
Land and improvements	5,324	4,730
Building and improvements	46,205	44,008
Machinery and equipment	82,752	74,911
Furniture and fixtures	3,895	3,568
Construction in progress	2,294	2,654
	140,470	129,871
Less accumulated depreciation	65,623	56,802
Net Property and Equipment	74,847	73,069
Other Assets		
Goodwill	103,619	99,558
Other non-amortizable intangible assets	15,649	14,938
Amortizable intangible assets, net of accumulated amortization of $40,835 and $37,049 at May 31, 2019 and 2018, respectively	52,096	54,655
Total Other Assets	171,364	169,151
Total Assets	$695,740	$618,009

See accompanying notes to consolidated financial statements.

Neogen Corporation and Subsidiaries
Consolidated Balance Sheets – Liabilities and Equity
(in thousands, except share and per share)

	May 31	
	2019	2018
Liabilities and Equity		
Current Liabilities		
Accounts payable	$ 19,063	$ 20,750
Accruals		
Accrued compensation	7,085	6,065
Income taxes	601	165
Other accruals	11,502	11,708
Total Current Liabilities	38,251	38,688
Deferred Income Taxes	15,618	14,103
Other Non-Current Liabilities	3,972	5,043
Total Liabilities	57,841	57,834
Commitments and Contingencies (note 7)		
Equity		
Preferred stock, $1.00 par value — shares authorized 100,000; none issued and outstanding	—	—
Common stock, $0.16 par value — shares authorized 120,000,000; 52,216,589 and 51,735,732 shares issued and outstanding at May 31, 2019 and 2018, respectively	8,355	8,278
Additional paid-in capital	221,937	202,572
Accumulated other comprehensive loss	(11,640)	(9,746)
Retained earnings	419,247	359,071
Total Neogen Corporation and Subsidiaries Stockholders' Equity	637,899	560,175
Total Liabilities and Stockholders' Equity	$695,740	$618,009

See accompanying notes to consolidated financial statements.

Neogen Corporation and Subsidiaries
Consolidated Statements of Income
(in thousands, except per share)

	Year Ended May 31		
	2019	2018	2017
Revenues			
Product revenues	$339,439	$331,288	$303,148
Service revenues	74,747	66,642	55,129
Total Revenues	414,186	397,930	358,277
Cost of Revenues			
Cost of product revenues	179,660	173,725	156,295
Cost of service revenues	42,606	37,933	33,058
Total Cost of Revenues	222,266	211,658	189,353
Gross Margin	191,920	186,272	168,924
Operating Expenses			
Sales and marketing	70,230	66,929	59,380
General and administrative	40,791	38,294	34,214
Research and development	12,805	10,855	10,385
Total Operating Expenses	123,826	116,078	103,979
Operating Income	68,094	70,194	64,945
Other Income			
Interest income, net	4,683	2,043	838
Royalty income	150	147	171
Other, net	32	1,081	719
Total Other Income	4,865	3,271	1,728
Income Before Income Taxes	72,959	73,465	66,673
Provision for Income Taxes	12,783	10,250	22,700
Net Income	60,176	63,215	43,973
Net Income Attributable to Non-controlling Interest	—	(70)	(180)
Net Income Attributable to Neogen	$ 60,176	$ 63,145	$ 43,793
Net Income Attributable to Neogen per Share			
Basic	$ 1.16	$ 1.23	$ 0.87
Diluted	$ 1.15	$ 1.21	$ 0.86

See accompanying notes to consolidated financial statements.

Neogen Corporation and Subsidiaries
Consolidated Statements of Comprehensive Income
(in thousands, except per share)

	Year Ended May 31		
	2019	2018	2017
Net Income	$60,176	$63,215	$43,973
Other comprehensive loss, net of tax: foreign currency translations	(1,894)	(2,543)	(3,257)
Comprehensive income	58,282	60,672	40,716
Comprehensive income loss attributable to non-controlling interest	—	(70)	(180)
Comprehensive income attributable to Neogen	$58,282	$60,602	$40,536

See accompanying notes to consolidated financial statements.

Neogen Corporation and Subsidiaries
Consolidated Statements of Equity
(in thousands, except shares)

	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Non-Controlling Interest	Total Equity
Balance, May 31, 2016	50,090,252	$8,014	$147,996	$ (3,946)	$252,133	$ (37)	$404,160
Exercise of options, share-based compensation and $3,922 income tax benefit	817,284	131	26,589	—	—	—	26,720
Issuance of shares under employee stock purchase plan	24,953	4	921	—	—	—	925
Purchase of minority interest	—	—	(764)	—	—	—	(764)
Net income for 2017	—	—	—	—	43,793	180	43,973
Other comprehensive loss	—	—	—	(3,257)	—	—	(3,257)
Balance, May 31, 2017	50,932,489	8,149	174,742	(7,203)	295,926	143	471,757
Exercise of options, share-based compensation	781,116	125	26,992	—	—	—	27,117
Issuance of shares under employee stock purchase plan	22,127	4	1,048	—	—	—	1,052
Purchase of minority interest	—	—	(210)	—	—	(213)	(423)
Net income for 2018	—	—	—	—	63,145	70	63,215
Other comprehensive loss	—	—	—	(2,543)	—	—	(2,543)
Balance, May 31, 2018	51,735,732	8,278	202,572	(9,746)	359,071	—	560,175
Exercise of options, share-based compensation	512,527	82	21,335	—	—	—	21,417
Issuance of shares under employee stock purchase plan	18,330	3	1,157	—	—	—	1,160
Shares repurchased	(50,000)	(8)	(3,127)	—	—	—	(3,135)
Net income for 2019	—	—	—	—	60,176	—	60,176
Other comprehensive loss	—	—	—	(1,894)	—	—	(1,894)
Balance, May 31, 2019	52,216,589	$8,355	$221,937	$ (11,640)	$419,247	$ —	$637,899

See accompanying notes to consolidated financial statements.

Neogen Corporation and Subsidiaries
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended May 31		
	2019	2018	2017
Cash Flows From Operating Activities			
Net income	$ 60,176	$ 63,215	$ 43,973
Adjustments to reconcile net income to net cash provided from operating activities:			
Depreciation and amortization	17,624	17,058	14,691
Deferred income taxes	1,197	(2,996)	(292)
Share-based compensation	5,543	4,909	5,261
Excess income tax benefit from exercise of stock options	—	—	(3,922)
Changes in operating assets and liabilities, net of business acquisitions:			
Accounts receivable	(4,025)	(10,233)	5,035
Inventories	(10,437)	(2,647)	(6,970)
Prepaid expenses and other assets	(3,569)	(2,275)	812
Accounts payable	(1,461)	4,381	(1,691)
Accruals and other changes	(1,206)	(2,281)	3,377
Net Cash From Operating Activities	63,842	69,131	60,274
Cash Flows Used in Investing Activities			
Purchase of property, equipment and other non-current intangible assets	(14,661)	(20,946)	(14,578)
Proceeds from the sales of marketable securities	339,225	299,751	149,226
Purchase of marketable securities	(437,324)	(361,419)	(162,755)
Business acquisitions, net of cash acquired	(6,388)	(468)	(34,029)
Net Cash Used in Investing Activities	(119,148)	(83,082)	(62,136)
Cash Flows From Financing Activities			
Exercise of stock options and other	17,034	23,261	21,148
Repurchase of common stock	(3,135)	—	—
Excess income tax benefit from the exercise of stock options	—	—	3,922
Purchase of non-controlling minority interest	—	(423)	—
Net Cash From Financing Activities	13,899	22,838	25,070
Effect of Exchange Rate on Cash	21	(3,380)	(898)
Net (Decrease) Increase in Cash and Cash Equivalents	(41,386)	5,507	22,310
Cash and Cash Equivalents, Beginning of Year	83,074	77,567	55,257
Cash and Cash Equivalents, End of Year	$ 41,688	$ 83,074	$ 77,567
Supplementary Cash Flow Information			
Income taxes paid, net of refunds	$ 13,027	$ 14,966	$ 17,704

See accompanying notes to consolidated financial statements.

Neogen Corporation and Subsidiaries
Notes to Consolidated Financial Statements

1. Summary of Significant Accounting Policies

Nature of Operations

Neogen Corporation develops, manufactures and markets a diverse line of products and services dedicated to food and animal safety.

Basis of Consolidation

The consolidated financial statements include the accounts of Neogen Corporation and its subsidiaries, all of which are wholly-owned as of May 31, 2019. Neogen Latinoamérica was 100% owned as of May 31, 2019 and May 31, 2018; Neogen purchased all shares owned by the minority interest owner on December 31, 2017, which increased its ownership in Neogen Latinoamérica from 90% to 100%. For Neogen do Brasil, the Company purchased the 10% owned by two minority interest owners on February 28, 2017, which increased its ownership interest to 100%. Non-controlling interest represents the non-controlling owners' proportionate share in the equity of these subsidiaries; the non-controlling owners' proportionate share in the income or losses of the subsidiaries is subtracted from, or added to, Neogen's net income to calculate the net income attributable to Neogen Corporation.

All intercompany accounts and transactions have been eliminated in consolidation.

Share and per share amounts reflect the December 29, 2017 4-for-3 stock split as if it took place at the beginning of the period presented.

Recently Adopted Accounting Standards

Revenue Recognition

On June 1, 2018, the Company adopted ASU No. 2014-09—Revenue from Contracts with Customers (Topic 606). Refer to the Revenue Recognition section of Note 1 to the consolidated financial statements for further information.

Classification of Cash Receipts and Payments

In August 2016, the FASB issued ASU No. 2016-15—Classification of Certain Cash Receipts and Cash Payments (a consensus of the Emerging Issues Task Force). The amendments in ASU 2016-15 address eight specific cash flow issues and apply to all entities that are required to present a statement of cash flows under FASB Accounting Standards Codification (FASB ASC) 230, Statement of Cash Flows. The amendments in ASU 2016-15 are effective for public business entities for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The Company adopted this ASU on June 1, 2018; the impact on its consolidated financial statements was immaterial.

Recent Accounting Pronouncements Not Yet Adopted

Leases

In February 2016, the FASB issued ASU No. 2016-02—Leases to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities on the balance sheet and disclosing key information about leasing arrangements. A lessee should recognize in the statement of financial position a liability to make lease payments (the lease liability) and a right-of-use asset representing its right to use the underlying asset for the lease term. The recognition, measurement and presentation of expenses and cash flows arising from a lease by a lessor have not significantly changed from previous U.S. GAAP. This ASU is effective for annual periods, including interim periods within those annual periods, beginning after December 15, 2018. Modified retrospective application is required with certain practical expedients. The Company will adopt this ASU on June 1, 2019. The Company has performed a review of its lessee and lessor arrangements, including revenue through leasing programs as well as lease expenses, which primarily result from operating lease arrangements at most of the Company's facilities. The Company will record a right-of-use (ROU) asset and corresponding lease liability on the balance sheet in the first quarter of fiscal 2020 and has determined the impact of this pronouncement on its consolidated financial condition and results of operations is immaterial.

Financial Instruments- Credit Losses

In June 2016, the FASB issued ASU No. 2016-13—Measurement of Credit Losses on Financial Instruments, which changes how companies measure credit losses on most financial instruments measured at amortized cost and certain other instruments, such as loans, receivables and held-to-maturity debt securities. Rather than generally recognizing credit losses when it is probable that the loss has been incurred, the revised guidance requires companies to recognize an allowance for credit losses for the difference between the amortized cost basis of a financial instrument and the amount of amortized cost that the company expects to collect over the instrument's contractual life. ASU 2016-13 is effective for fiscal periods beginning after December 15, 2019 and must be adopted as a cumulative effect adjustment to retained earnings. Early adoption is permitted. The Company does not believe adoption of this guidance will have an impact on its consolidated financial statements.

Fair Value Measurements

In August 2018, the FASB issued ASU 2018-3, Fair Value Measurement (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement, which modifies the disclosure requirements of fair value measurements. ASU 2018-13 is effective for fiscal years beginning after December 15, 2019 and early adoption is permitted. The Company does not believe adoption of this guidance will have an impact on its consolidated financial statements.

Cloud Computing Implementation Cost

In August 2018, the FASB issued ASU 2018-15, Intangible-Goodwill and Other Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Cost Incurred in a Cloud Computing Arrangement That Is a Service Contract, which clarifies the accounting for implementation costs in cloud computing arrangements. ASU 2018-15 is effective for fiscal years beginning after December 15, 2019 and early adoption is permitted. The Company does not believe adoption of this guidance will have an impact on its consolidated financial statements.

Comprehensive Income

Comprehensive income represents net income and any revenues, expenses, gains and losses that, under U.S. generally accepted accounting principles, are excluded from net income and recognized directly as a component of equity. Accumulated other comprehensive income (loss) consists solely of foreign currency translation adjustments.

Fair Value of Financial Instruments

The carrying amounts of the Company's financial instruments other than cash equivalents and marketable securities, which include accounts receivable and accounts payable, approximate fair value based on either their short maturity or current terms for similar instruments.

Fair value measurements are determined based upon the exit price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants exclusive of any transaction costs. The Company utilizes a fair value hierarchy based upon the observability of inputs used in valuation techniques as follows:

Level 1:	Observable inputs such as quoted prices in active markets;
Level 2:	Inputs, other than quoted prices in active markets, that are observable either directly or indirectly; and
Level 3:	Unobservable inputs in which there is little or no market data, which require the reporting entity to develop its own assumptions.

Cash and Cash Equivalents

Cash and cash equivalents consist of bank demand accounts, savings deposits, certificates of deposit and commercial paper with original maturities of 90 days or less. Cash and cash equivalents are maintained at financial institutions and, at times, balances may exceed federally insured limits. The Company has never experienced any losses related to these balances and believes it is not exposed to significant credit risk regarding its cash and cash equivalents. Cash and cash equivalents were $41,688,000 and $83,074,000 at May 31, 2019 and 2018, respectively. The carrying value of these assets approximates fair value due to the short maturity of these instruments and meets the Level 1 criteria. Cash held by foreign subsidiaries was $8,711,000 and $7,101,000 at May 31, 2019 and 2018, respectively.

Marketable Securities

The Company has marketable securities held by banks or broker-dealers at May 31, 2019, consisting of short-term domestic certificates of deposit of $17,681,000 and commercial paper and US treasuries rated at least A-1/P-1 (short-term) and A/A2 (long-term) with original maturities between 91 days and two years of $208,155,000. Total outstanding marketable securities at May 31, 2019 was $225,836,000; there were $127,736,000 in marketable securities outstanding at May 31, 2018. These securities are classified as available for sale. The primary objective of management's short-term investment activity is to preserve capital for the purpose of funding operations, capital expenditures and business acquisitions; short-term investments are not entered into for trading or speculative purposes. These securities are recorded at fair value (that approximates cost) based on recent trades or pricing models and therefore meet the Level 2 criteria. Interest income on these investments is recorded within Other Income on the income statement.

Marketable Securities as of May 31, 2019 and 2018 are listed below by classification and remaining maturities.

		Year ended May 31	
	Maturity	2019	2018
US Treasuries	0 – 90 days	2,470,000	19,910,000
	91 – 180 days	—	—
	181 days – 1 year	2,435,000	—
	1 – 2 years	2,505,000	—
Commercial Paper	0 – 90 days	84,338,000	47,740,000
	91 – 180 days	47,960,000	32,673,000
	181 days – 1 year	34,369,000	—
	1 – 2 years	34,078,000	—
Certificates of Deposit	0 – 90 days	7,732,000	5,446,000
	91 – 180 days	5,000,000	8,747,000
	181 days – 1 year	750,000	13,220,000
	1 – 2 years	4,199,000	—
Total Marketable Securities		**225,836,000**	**127,736,000**

Use of Estimates

The preparation of these financial statements requires that management make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosures of contingent assets and liabilities. On an ongoing basis, management evaluates the estimates, including, but not limited to, variable consideration related to revenue recognition, allowances for doubtful accounts, the market value of, and demand for, inventories, stock-based compensation, provision for income taxes and related balance sheet accounts, accruals, goodwill and other intangible assets. These estimates are based on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Accounts Receivable and Concentrations of Credit Risk

Financial instruments which potentially subject Neogen to concentrations of credit risk consist principally of accounts receivable. Management attempts to minimize credit risk by reviewing customers' credit history before extending credit and by monitoring credit exposure on a regular basis. An allowance for doubtful accounts on accounts receivable is established based upon factors surrounding the credit risk of specific customers, historical trends and other information. Collateral or other security is generally not required for accounts receivable. Once a receivable balance has been determined to be uncollectible, that amount is charged against the allowance for doubtful accounts. No customer accounted for more than 10% of accounts receivable at May 31, 2019 or 2018, respectively. The activity in the allowance for doubtful accounts was as follows:

	Year ended May 31		
(in thousands)	2019	2018	2017
Beginning Balance	$1,550	$2,000	$1,500
Provision	263	152	645
Recoveries	38	40	25
Write-offs	(151)	(642)	(170)
Ending Balance	$1,700	$1,550	$2,000

Inventories

Inventories are stated at the lower of cost or net realizable value, determined on the first-in, first-out method. The components of inventories were as follows:

	Year ended May 31	
(in thousands)	**2019**	**2018**
Raw Materials	$41,594	$36,702
Work-in-process	5,581	5,993
Finished goods	38,817	33,310
	$85,992	$76,005

The Company's inventories are analyzed for slow moving, expired and obsolete items on a quarterly basis and the valuation allowance is adjusted as required. The valuation allowance for inventory was $2,250,000 and $2,200,000 at May 31, 2019 and 2018, respectively.

Property and Equipment

Property and equipment is stated at cost. Expenditures for major improvements are capitalized while repairs and maintenance are charged to expense. Depreciation is provided on the straight-line method over the estimated useful lives of the respective assets, which are generally seven to 39 years for buildings and improvements and three to ten years for furniture, fixtures, machinery and equipment. Depreciation expense was $11,315,000, $10,315,000 and $8,783,000 in fiscal years 2019, 2018 and 2017, respectively.

Goodwill and Other Intangible Assets

Goodwill represents the excess of purchase price over fair value of tangible net assets of acquired businesses after amounts are allocated to other identifiable intangible assets. Other intangible assets include customer relationships, trademarks, licenses, trade names, covenants not-to-compete and patents. Amortizable intangible assets are amortized on either an accelerated or a straight-line basis, generally over 5 to 25 years. Management reviews the carrying amounts of goodwill and other non-amortizable intangible assets annually, or when indications of impairment exist, to determine if such assets may be impaired by performing a quantitative assessment. If the carrying amounts of these assets are deemed to be less than fair value based upon a discounted cash flow analysis and comparison to comparable earnings multiples of peer companies, such assets are reduced to their estimated fair value and a charge is made to operations. The remaining weighted-average amortization period for intangibles was 10 years and 11 years at May 31, 2019 and May 31, 2018, respectively.

Long-lived Assets

Management reviews the carrying values of its long-lived assets to be held and used, including definite-lived intangible assets, for possible impairment whenever events or changes in business conditions warrant such a review. The carrying value of a long-lived asset is considered impaired when the anticipated separately identifiable undiscounted cash flows over the remaining useful life of the asset are less than the carrying value of the asset. In such an event, fair value is determined using discounted cash flows, and if lower than the carrying value, impairment is recognized through a charge to operations.

Reclassifications

Certain amounts in the fiscal 2018 and 2017 financial statements have been reclassified to conform with the fiscal 2019 presentation.

Equity Compensation Plans

At May 31, 2019, the Company had stock option plans which are described more fully in Note 5 to the consolidated financial statements.

The weighted-average fair value per share of stock options granted during fiscal years 2019, 2018 and 2017, estimated on the date of grant using the Black-Scholes option pricing model, was $14.91, $14.47 and $11.89, respectively. The fair value of stock options granted was estimated using the following weighted-average assumptions:

	Year ended May 31		
	2019	2018	2017
Risk-free interest rate	2.6%	1.6%	1.2%
Expected dividend yield	0.0%	0.0%	0.0%
Expected stock volatility	27.0%	27.7%	35.2%
Expected option life	3.5 years	4.0 years	4.0 years

The risk-free interest rate for periods within the expected life of options granted is based on the United States Treasury yield curve in effect at the time of grant. Expected stock price volatility is based on historical volatility of the Company's stock. The expected option life, representing the period of time that options granted are expected to be outstanding, is based on historical option exercise and employee termination data. Prior to the fiscal 2017 grants, Neogen recognized the fair value of stock options using the accelerated method over their requisite service periods which management has determined to be the vesting periods; for options granted in fiscal years 2019, 2018 and 2017, the Company recognized the fair value of stock options using the straight-line method.

Shipping and Handling Costs

Shipping and handling costs that are charged to and reimbursed by the customer are recognized as revenues, while the related expenses incurred by Neogen are recorded in sales and marketing expense; these expenses totaled $13,503,000, $12,147,000 and $10,185,000 in fiscal years 2019, 2018 and 2017, respectively.

Income Taxes

The Company accounts for income taxes using the asset and liability method. Under this method, deferred income tax assets and liabilities are determined based on differences between the financial reporting and tax bases of assets and liabilities and for tax credit carryforwards and are measured using the enacted tax rates in effect for the years in which the differences are expected to reverse. Deferred income tax expense represents the change in net deferred income tax assets and liabilities during the year.

The Company's wholly-owned foreign subsidiaries are comprised of Neogen Europe, Lab M Holdings, Quat-Chem, Neogen do Brasil, Rogama Industria e Comercio Ltda, Neogen Latinoamérica, Neogen Bio-Scientific Technology Co (Shanghai), Neogen Food and Animal Security (India), Neogen Canada, and Neogen Australasia Pty Limited. Based on historical experience, as well as management's future plans, earnings from these subsidiaries are expected to be re-invested indefinitely for future expansion and working capital needs. Furthermore, Neogen's domestic operations have historically produced sufficient operating cash flow to mitigate the need to remit foreign earnings. On an annual basis, the Company evaluates the current business environment and whether any new events or other external changes might require a re-evaluation of the decision to indefinitely re-invest foreign earnings. At May 31, 2019, unremitted earnings of the Company's foreign subsidiaries were $55,553,000.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "U.S. Tax Act") was signed into law making significant changes to the Internal Revenue Code. Changes include a federal corporate tax rate reduced from 35% to 21% for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial system, and a one-time transition tax on the mandatory deemed repatriation of foreign earnings. The U. S. Tax Act also includes a provision to tax global intangible low-taxed income (GILTI) of foreign subsidiaries and a deduction for foreign derived intangible income (FDII), both of which became effective for us beginning June 1, 2018. See Note 6 to the consolidated financial statements for further information.

Research and Development Costs

Research and development costs, which consist primarily of compensation costs, administrative expenses and new product development, among other items, are expensed as incurred.

Advertising Costs

Advertising costs are expensed as incurred and totaled $1,471,000, $1,411,000 and $1,426,000 in fiscal years 2019, 2018 and 2017, respectively.

Net Income Attributable to Neogen per Share

Basic net income per share is based on the weighted average number of common shares outstanding during each year. Diluted earnings per share is based on the weighted average number of common shares and dilutive potential common shares outstanding. Our dilutive potential common shares outstanding during the years result entirely from dilutive stock options. The following table presents the net income per share calculations:

	Year ended May 31		
(in thousands, except per share)	**2019**	**2018**	**2017**
Numerator for basic and diluted net income per share - Net Income attributable to Neogen	$60,176	$63,145	$43,793
Denominator for basic net income per share - Weighted average shares	51,888	51,358	50,544
Effect of dilutive stock options	537	791	621
Denominator for diluted net income per share	52,425	52,149	51,165
Net income attributable to Neogen per share			
Basic	$ 1.16	$ 1.23	$ 0.87
Diluted	$ 1.15	$ 1.21	$ 0.86

At May 31, 2019, 5,000 shares were excluded from the computation of diluted net income per share, as the option exercise prices exceeded the average market price of the common shares. In 2018 and 2017, all shares were included in the computation.

Revenue Recognition

On June 1, 2018, Neogen adopted ASC Topic 606—Revenue from Contracts with Customers (Topic 606). This guidance outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. The core principle of the revenue model is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Neogen adopted this standard using the full retrospective approach. This approach was chosen to provide appropriate comparisons against the Company's prior year financial statements; accordingly, historical information for the years ended May 31, 2018 and 2017 has been adjusted to conform to the new standard.

The adoption of Topic 606 did not have a material impact on the consolidated financial statements.

Under Topic 606, the Company determines the amount of revenue to be recognized through application of the following steps:

- Identification of the contract with a customer;
- Identification of the performance obligations in the contract;
- Determination of the transaction price;
- Allocation of the transaction price to the performance obligations in the contract; and
- Recognition of revenue when or as the Company satisfies the performance obligations.

Essentially all of Neogen's revenue is generated through contracts with its customers. A performance obligation is a promise in a contract to transfer a product or service to a customer. The Company generally recognizes revenue at a point in time when all of its performance obligations under the terms of a contract are satisfied. With the adoption of Topic 606, revenue is recognized upon transfer of control of promised products and services in an amount that reflects the consideration the Company expects to receive in exchange for those products or services. The collectability of consideration

on the contract is reasonably assured before revenue is recognized. To the extent that customer payment has been received before all recognition criteria are met, these revenues are initially deferred in other accruals on the balance sheet and the revenue is recognized in the period that all recognition criteria have been met. In certain situations, Neogen provides rebates, marketing support, credits or incentives to select customers, which are accounted for as variable consideration when estimating the amount of revenue to recognize on a contract. Variable consideration reduces the amount of revenue that is recognized. These variable consideration estimates are updated at the end of each reporting period based on information currently available.

The performance obligations in Neogen's contracts are generally satisfied well within one year of contract inception. In such cases, management has elected the practical expedient to not adjust the promised amount of consideration for the effects of a significant financing component. Management has elected to utilize the practical expedient to recognize the incremental costs of obtaining a contract as an expense when incurred because the amortization period for the prepaid costs that would otherwise have been deferred and amortized is one year or less. The Company accounts for shipping and handling for products as a fulfillment activity when goods are shipped. Revenue is recognized net of any tax collected from customers; the taxes are subsequently remitted to governmental authorities. The Company's terms and conditions of sale generally do not provide for returns of product or reperformance of service except in the case of quality or warranty issues. These situations are infrequent; due to immateriality of the amount, warranty claims are recorded in the period incurred.

The Company derives revenue from two primary sources — product revenue and service revenue.

Product revenue consists primarily of shipments of:

- Diagnostic test kits, culture media and related products used by food producers and processors to detect harmful natural toxins, foodborne bacteria, allergens and levels of general sanitation;
- Consumable products marketed to veterinarians, retailers, livestock producers and animal health product distributors; and
- Rodenticides, disinfectants and insecticides to assist in the control of rodents, insects and disease in and around agricultural, food production and other facilities.

Revenue for Neogen's products are recognized and invoiced when the product is shipped to the customer.

Service revenue consists primarily of:

- Genomic identification and related interpretive bioinformatic services; and
- Other commercial laboratory services.

Revenues for Neogen's genomics and commercial laboratory services are recognized and invoiced when the applicable laboratory service is performed and the results are conveyed to the customer.

Payment terms for products and services are generally 30 to 60 days.

The following table presents disaggregated revenue by major product and service categories for the years ended May 31, 2019 and 2018:

(dollars in thousands)	Year Ended May 31, 2019	Increase/ (Decrease)	May 31, 2018	Increase/ (Decrease)	May 31, 2017
Food Safety:					
Natural Toxins, Allergens & Drug Residues	$ 78,373	7%	$ 72,962	3%	$ 70,926
Bacterial & General Sanitation	41,966	10%	38,156	10%	34,706
Culture Media & Other	49,857	13%	44,271	12%	39,367
Rodenticides, Insecticides & Disinfectants	25,584	7%	23,821	75%	13,620
Genomics Services	17,694	16%	15,267	34%	11,415
	213,474	10%	194,477	14%	170,034
Animal Safety:					
Life Sciences	7,858	(25)%	10,411	7%	9,704
Veterinary Instruments & Disposables	44,582	(7)%	47,749	15%	41,693
Animal Care & Other	29,941	(3)%	30,930	11%	27,891
Rodenticides, Insecticides & Disinfectants	66,389	(2)%	67,646	(3)%	69,429
Genomics Services	51,942	11%	46,717	18%	39,526
	200,712	(1)%	203,453	8%	188,243
Total Revenue	$ 414,186	4%	$ 397,930	11%	$ 358,277

See Note 9 to the consolidated financial statements for disaggregated revenues by geographical location.

Revision of Previously Issued Financial Statements

The Company has historically classified certain variable consideration components resulting from volume rebates, distributor support, and other marketing discounts as cost of revenues or sales and marketing expense in its consolidated financial statements of income. These amounts should have been classified as contra revenue in product or service revenues. The Company had determined in prior periods that the misstatements were clearly immaterial, individually and in the aggregate, to each of the reporting periods affected. The Company began properly classifying these items as contra revenues beginning in the fiscal year ended May 31, 2019 and has revised the financials for prior fiscal years 2018 and 2017 to conform to the current period presentation. These immaterial adjustments had no impact on the Company's operating income, income before taxes, net income or reported earnings per share, and no change to stockholders' equity.

Presented below are the effects of the revisions on the line items within our previously issued consolidated statements of income for the years ended May 31, 2018 and 2017. Revised consolidated statements of income related to these periods are presented in this Form 10-K.

	Year Ended May 31, 2018			Year Ended May 31, 2017		
	As Previously Reported	Adjustments	As Revised	As Previously Reported	Adjustments	As Revised
		(in thousands)			*(in thousands)*	
Revenues						
Product revenues	$335,554	$ (4,266)	$331,288	$306,512	$ (3,390)	$303,148
Service revenues	66,698	(56)	66,642	55,082	73	55,129
Total revenues	402,252	(4,322)	397,930	361,594	(3,317)	358,277
Cost of revenues						
Cost of product revenues	174,067	(342)	173,725	156,568	(273)	156,295
Cost of service revenues	37,933	—	37,933	33,058	—	33,058
Total cost of revenues	212,000	(342)	211,658	189,626	(273)	189,353
Gross margin	190,252	(3,980)	186,272	171,968	(3,044)	168,924
Operating expenses						
Sales and marketing	70,909	(3,980)	66,929	62,424	(3,044)	59,380
Total operating expenses	120,058	(3,980)	116,078	107,023	(3,044)	103,979
Operating income	70,194	—	70,194	64,945	—	64,945

The revisions had no impact on our audited consolidated balance sheets as of May 31, 2018 and 2017 and no impact on our audited consolidated statements of equity or audited consolidated statements of cash flows for the fiscal years ended May 31, 2018 and 2017.

2. Goodwill and Other Intangible Assets

Management has completed the annual impairment analysis of goodwill and intangible assets with indefinite lives using a quantitative assessment as of the first day of the fourth quarter of fiscal years 2019, 2018 and 2017, respectively, and determined that recorded amounts were not considered impaired and that no write-down was necessary.

The following table summarizes goodwill by reportable segment:

(in thousands)	Food Safety	Animal Safety	Total
Balance, May 31, 2017	$ 45,920	$ 58,839	$104,759
Goodwill acquired	—	757	757
Goodwill adjustments and/or currency (1)	(5,919)	(39)	(5,958)
Balance, May 31, 2018	$ 40,001	$ 59,557	$ 99,558
Goodwill acquired	3,796	1,196	4,992
Goodwill adjustments and/or currency (1)	(1,244)	313	(931)
Balance, May 31, 2019	$ 42,553	$ 61,066	$103,619

(1) Includes final purchase price allocation adjustment.

At May 31, 2019, non-amortizable intangible assets included licenses of $569,000, trademarks of $13,717,000 and other intangibles of $1,363,000. At May 31, 2018, non-amortizable intangible assets included licenses of $569,000, trademarks of $12,989,000 and other intangibles of $1,380,000.

Amortizable intangible assets consisted of the following and are included in customer-based intangibles and other non-current assets within the consolidated balance sheets:

(in thousands)	Gross Carrying Amount	Less Accumulated Amortization	Net Carrying Amount
Licenses	$ 9,813	$ 3,182	$ 6,631
Covenants not to compete	862	542	320
Patents	8,158	3,570	4,588
Customer-based intangibles	57,634	28,017	29,617
Other products and service-related intangibles	16,464	5,524	10,940
Balance, May 31, 2019	$92,931	$ 40,835	$52,096
Licenses	$ 9,491	$ 2,523	$ 6,968
Covenants not to compete	801	483	318
Patents	9,693	5,013	4,680
Customer-based intangibles	56,420	24,579	31,841
Other products and service-related intangibles	15,299	4,451	10,848
Balance, May 31, 2018	$91,704	$ 37,049	$54,655

Amortization expense for intangibles totaled $6,309,000, $6,743,000 and $5,908,000 in fiscal years 2019, 2018, and 2017, respectively. The estimated amortization expense for each of the five succeeding fiscal years is as follows: $6,664,000 in 2020, $6,025,000 in 2021, $5,673,000 in 2022, $5,299,000 in 2023 and $4,989,000 in 2024. The amortizable intangible assets useful lives are 2 to 20 years for licenses, 5 to 13 years for covenants not to compete, 5 to 25 years for patents, 5 to 20 years for customer-based intangibles and 5 to 20 years for other product and service-related intangibles, which primarily consist of product formulations. All definite-lived intangibles are amortized on a straight-line basis with the exception of definite-lived customer-based intangibles and product and service-related intangibles, which are amortized on either a straight-line or an accelerated basis.

3. Business Combinations

The Consolidated Statements of Income reflect the results of operations for business acquisitions since the respective dates of purchase. All are accounted for using the acquisition method. Goodwill recognized in the acquisitions described below relates primarily to enhancing the Company's strategic platform for the expansion of available product offerings.

Fiscal 2017

On December 1, 2016, the Company acquired the stock of Quat-Chem Ltd., a chemical company that manufactures biosecurity products, based in Rochdale, England. Consideration for the purchase was $21,606,000 in cash and up to $3,778,000 of contingent consideration, due at the end of each of the first two years, based on an excess net sales formula. The final purchase price allocation, based upon the fair value of these assets and liabilities determined using the income approach, included accounts receivable of $4,684,000, inventory of $1,243,000, land, property and equipment of $2,526,000, accounts payable of $2,197,000, deferred tax liability of $1,758,000, contingent consideration accrual of $1,058,000, other current liabilities of $604,000, non-amortizable intangible assets of $1,889,000, intangible assets of $6,900,000 (with an estimated life of 5-15 years) and the remainder to goodwill (non-deductible for tax purposes). These values are Level 3 fair value measurements. In January 2018, Neogen paid the former owners $249,000 in contingent consideration based on the achievement of sales targets in the first year, and recorded a credit of $255,000 to Other Income, reducing the contingent consideration accrual by a corresponding amount; $554,000 remained accrued for contingent consideration payable at the end of the second year. In January 2019, Neogen paid the former owners $184,000 in contingent consideration based on the achievement of sales targets in the second year; the remaining accrual balance was adjusted to Other Income. This business continues to operate in its current location and is managed by Neogen Europe, reporting within the Food Safety segment.

On December 27, 2016, the Company acquired the stock of Rogama Industria e Comercio, Ltda., a company that develops and manufactures rodenticides and insecticides, based near São Paulo, Brazil. Consideration for the purchase was $12,423,000 in cash and up to $2,069,000 of contingent consideration, due at the end of each of the first two years, based on an excess net sales formula. The final purchase price allocation, based upon the fair value of these assets and liabilities determined using the income approach, included accounts receivable of $1,866,000, other non-current assets of $26,000, inventory of $960,000, land, property and equipment of $4,734,000, current liabilities of $2,562,000, contingent consideration accrual of $213,000, deferred tax liability of $2,034,000, non-amortizable intangible assets of $870,000, intangible assets of $5,112,000 (with an estimated life of 5-15 years) and the remainder to goodwill (deductible for tax purposes). These values are Level 3 fair value measurements. In April 2018, Neogen paid the former owners $130,000 in contingent consideration based on the achievement of sales targets in the first year. The contingent consideration accrual was reduced by the same amount; $83,000 remained accrued for contingent consideration payable at the end of the second year. In April 2019, the Company paid the former owners $23,000 in contingent consideration based on the achievement of sales targets in the second year; the remaining accrual balance was adjusted to Other Income. This business continues to operate in its current location and is managed by Neogen do Brasil, reporting within the Food Safety segment.

Fiscal 2018

On September 1, 2017, the Company acquired the assets of The University of Queensland Animal Genetics Laboratory, an animal genomics laboratory located near Brisbane, Australia. This acquisition is intended to accelerate the growth of Neogen's animal genomics business in Australia and New Zealand. Consideration for the purchase was $2,063,000; $468,000 was initially paid in cash with the remainder due in annual installments over the next five years. The final purchase price allocation, based upon the fair value of these assets and liabilities determined using the income approach, included inventory of $19,000, equipment of $419,000, non-current liabilities of $1,629,000, intangible assets of $902,000 (with an estimated life of 5-15 years) and the remainder to goodwill (non-deductible for tax purposes). These values are Level 3 fair value measurements. The business, renamed Neogen Australasia, continues to operate in its current location, reporting within the Animal Safety segment.

Fiscal 2019

On August 1, 2018, the Company acquired the stock of Clarus Labs, Inc., a manufacturer of water testing products. Neogen has distributed Clarus' Colitag water test to the food and beverage industries since 2004 and this acquisition gives the Company access to sell this product to new markets. Consideration for the purchase was $4,204,000 in cash and approximately $1.3 million of contingent consideration, due semiannually for the first five years, based on an excess net sales formula. The final purchase price allocation, based upon the fair value of these assets and liabilities determined using the income approach, included inventory of $32,000, machinery and equipment of $120,000, accounts payable of $53,000, contingent consideration accrual of $1,256,000, non-current deferred tax liability of $544,000, non-amortizable intangible assets of $878,000, intangible assets of $1,487,000 (with an estimated life of 5-15 years) and the remainder to goodwill (non-deductible for tax purposes). These values are Level 3 fair value measurements. In February 2019, $90,000 was paid to the former owners as contingent consideration from the accrual. Manufacturing of these products was moved to the Company's Lansing, Michigan location in October 2018, reporting within the Food Safety segment.

On September 4, 2018, the Company acquired the assets of Livestock Genetic Services, LLC, a Virginia-based company that specializes in genetic evaluations and data management for cattle breeding organizations. Livestock Genetic Services has been a long-time strategic partner of Neogen and the acquisition enhances the Company's in-house genetic evaluation capabilities. Consideration for the purchase was $1,100,000 in cash, with $700,000 paid at closing and $400,000 payable to the former owner on September 1, 2019, and approximately $385,000 of contingent consideration, payable over the next three years. The final purchase price allocation, based upon the fair value of these assets and liabilities determined using the income approach, included office equipment of $15,000, contingent consideration accrual of $385,000, intangible assets of $942,000 (with an estimated life of 5-15 years) and the remainder to goodwill (deductible for tax purposes). These values are Level 3 fair value measurements. Services provided by this operation are now performed at the Company's Lincoln, Nebraska location, reporting within the Animal Safety segment.

On January 1, 2019, the Company acquired the assets of Edmonton, Alberta-based Delta Genomics Centre, an animal genomics laboratory in Canada. Delta's laboratory operations were renamed Neogen Canada and the acquisition is intended to accelerate growth of the Company's animal genomics business in Canada. Consideration for the purchase was $1,485,000 in cash. The final purchase price allocation, based upon the fair value of these assets and liabilities determined using the income approach, included inventory of $38,000, machinery and equipment of $371,000, unearned revenue liability of $125,000, intangible assets of $532,000 (with an estimated life of 5 to 10 years) and the remainder to goodwill (deductible for tax purposes). These values are Level 3 fair value measurements. Services provided by this operation continue to be performed in Edmonton, reporting within the Animal Safety segment.

4. Long-Term Debt

The Company has a financing agreement with a bank providing for a $15,000,000 unsecured revolving line of credit, which was amended on November 30, 2018 to extend the maturity from September 30, 2019 to September 30, 2021. There were no advances against the line of credit during fiscal years 2019 and 2018; there was no balance outstanding at May 31, 2019. Interest on any borrowings is LIBOR plus 100 basis points (rate under the terms of the agreement was 3.49% at May 31, 2019). Financial covenants include maintaining specified levels of tangible net worth, debt service coverage, and funded debt to EBITDA, each of which the Company was in compliance with at May 31, 2019.

5. Equity Compensation Plans

Incentive and non-qualified options to purchase shares of common stock may be granted to directors, officers and employees of Neogen under the terms of the Company's stock option plans. These options are granted at an exercise price of not less than the fair market value of the stock on the date of grant. Remaining shares available for grant under stock option plans were 3,997,000, 1,913,000 and 2,525,000 at May 31, 2019, 2018 and 2017, respectively. Options vest ratably over three and five-year periods and the contractual terms are generally five or ten years.

(options in thousands)	Options	Weighted-Average Exercise Price	Weighted-Average Grant Date Fair Value
Outstanding at May 31, 2016 (875 exercisable)	2,775	$ 27.53	$ 7.97
Granted	828	40.68	11.89
Exercised	(827)	22.82	6.77
Forfeited	(77)	32.04	9.17
Outstanding at May 31, 2017 (661 exercisable)	2,699	32.88	9.51
Granted	829	59.37	14.47
Exercised	(821)	28.18	8.20
Forfeited	(208)	39.57	11.12
Outstanding at May 31, 2018 (508 exercisable)	2,499	42.63	11.44
Granted	527	62.92	14.91
Exercised	(513)	31.28	8.92
Forfeited	(128)	47.08	12.42
Outstanding at May 31, 2019 (617 exercisable)	2,385	49.37	12.70

The following is a summary of stock options outstanding at May 31, 2019:

Range of Exercise Price	Number	(in years)	Exercise Price	Number	Exercise Price
$10.17 - $37.26	575	1.7	$ 32.07	290	$ 30.62
$37.27 - $40.91	492	2.8	40.45	147	40.44
$40.92 - $59.78	172	4.0	51.03	54	49.19
$59.79 - $61.56	614	3.5	60.43	124	60.43
$61.57 - $68.96	532	4.5	63.03	2	68.36
	2,385	3.2	49.37	617	40.68

The weighted average exercise price of shares that were exercisable at May 31, 2019 and 2018 was $40.68 and $31.23, respectively.

Compensation expense related to share-based awards was $5,543,000, $4,909,000 and $5,261,000 in fiscal years 2019, 2018 and 2017, respectively. Remaining compensation cost to be expensed in future periods for non-vested options was $15,880,000 at May 31, 2019, with a weighted average expense recognition period of 3.4 years.

	Year Ended		
(in thousands)	May 31, 2019	May 31, 2018	May 31, 2017
Aggregate intrinsic value of options outstanding	$ 22,798	$ 82,649	$ 39,388
Aggregate intrinsic value of options exercisable	$ 10,222	$ 22,572	$ 13,929
Aggregate intrinsic value of options exercised	$ 21,382	$ 25,844	$ 18,067

Common stock totaling 365,395 of the 712,500 authorized shares are reserved for issuance under the terms of the 2011 Employee Stock Purchase Plan. The plan gives eligible employees the option to purchase common stock at a 5% discount to the lower of the market value of the stock at the beginning or end of each participation period; the discount is recorded in general and administrative expense. Total individual purchases in any year are limited to 10% of compensation. Shares purchased by employees were 18,330 in fiscal 2019, 22,127 in fiscal 2018 and 24,953 in fiscal 2017.

6. Income Taxes

Income before income taxes by source consists of the following amounts:

(in thousands)	Year ended May 31 2019	2018	2017
U.S.	$58,479	$62,310	$55,171
Foreign	14,480	11,155	11,502
	$72,959	$73,465	$66,673

The provision for income taxes consists of the following:

(in thousands)	Year ended May 31 2019	2018	2017
Current:			
U.S. Taxes	$ 8,451	$10,129	$20,259
Foreign	3,758	3,066	2,514
Deferred	574	(2,945)	(73)
Provision for Income Taxes	$12,783	$10,250	$22,700

The reconciliation of income taxes computed at the U.S. federal statutory tax rate to income tax expense is as follows:

(in thousands)	Year ended May 31 2019	2018	2017
Tax at U.S. statutory rate	$15,321	$21,459	$23,336
Section 199 domestic production deduction	—	(1,167)	(1,057)
Global intangible low-taxed income (GILTI)	840	—	—
Foreign derived intangible income deduction (FDII)	(1,531)	—	—
Foreign rate differential	495	(461)	(1,247)
Subpart F income	842	816	996
Tax benefits on stock-based compensation	(2,586)	(4,816)	(535)
FIN 48 reserve adjustments	13	(1,035)	576
Provision for state income taxes, net of federal benefit	1,251	975	972
Remeasurement of deferred taxes	—	(6,022)	—
Transition tax on foreign earnings and profits	—	1,223	—
Tax credits	(1,726)	(1,151)	(1,213)
Other	(136)	429	872
	$12,783	$10,250	$22,700

On June 1, 2017, the Company adopted ASU No. 2016-09—Compensation-Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting, which simplifies the accounting for share-based payments to employees. The guidance requires the recognition of the income effects of awards in the income statement when the awards vest or are settled, thus eliminating additional paid-in capital pools. The guidance also allows for a policy election to account for forfeitures as they occur, rather than on an estimated basis, and requires that excess tax benefits be classified as an operating activity on the Statement of Cash Flows. The adoption of this ASU decreased income tax expense by $2.6 million in fiscal 2019 and by $4.8 million in fiscal 2018.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the U.S. Tax Act) was signed into law, making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a federal corporate tax rate decrease from 35% to 21% for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial system, and a one-time transition tax on the mandatory deemed repatriation of foreign earnings. The U.S. Tax Act also includes a provision to tax global intangible low-taxed income (GILTI) of foreign subsidiaries and a deduction for foreign derived intangible income (FDII), both of which became effective for the Company beginning June 1, 2018.

In fiscal 2018, the Company recorded a net benefit of $4.8 million related to the U.S. Tax Act, due to the impact of the reduction in the tax rate on deferred tax assets and liabilities of $6.0 million, partially offset by $1.2 million of one-time transition tax on the deemed repatriation of foreign earnings. In fiscal 2019, the Company finalized its calculation of these amounts and recorded immaterial adjustments to income tax expense; the Company also recorded expense of $840,000 related to GILTI and a tax benefit of $1.5 million related to FDII.

Foreign tax credits, primarily offsetting taxes associated with Subpart F and GILTI income, were $1,296,000, $791,000 and $729,000 in fiscal years 2019, 2018 and 2017, respectively. The Company's U.S. R & D credit was $430,000 in fiscal 2019 and $422,000 in fiscal years 2018 and 2017.

Deferred income taxes reflect the tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of our deferred income tax liabilities and assets are as follows:

	Year ended May 31	
(in thousands)	**2019**	**2018**
Deferred income tax liabilities		
Indefinite and long-lived assets	$(18,963)	$(17,503)
Prepaid expenses	(586)	(573)
	(19,549)	(18,076)
Deferred income tax assets		
Stock Options	1,497	1,489
Inventories and accounts receivable	1,315	1,593
Tax loss carryforwards	417	134
Valuation allowance on tax loss carryforwards	(407)	—
Accrued expenses and other	1,109	757
	3,931	3,973
Net deferred income tax liabilities	$(15,618)	$(14,103)

The Company is no longer subject to examination by the Internal Revenue Service for 2016 and earlier tax years.

7. Commitments and Contingencies

The Company is involved in environmental remediation and monitoring activities at its Randolph, Wisconsin manufacturing facility and accrues for related costs when such costs are determined to be probable and estimable. The Company currently utilizes a pump and treat remediation strategy, which includes semi-annual monitoring and reporting, consulting, and maintenance of monitoring wells. Neogen expenses these annual costs of remediation, which have ranged from $38,000 to $131,000 per year over the past five years. The Company's estimated liability for these costs was $916,000 at both May 31, 2019 and 2018, measured on an undiscounted basis over an estimated period of 15 years; $100,000 of the liability is recorded within current liabilities and the remainder is recorded within other non-current liabilities in the consolidated balance sheet. In fiscal 2019, the Company performed an updated Corrective Measures Study (CMS) on the site, per a request from the Wisconsin Department of Natural Resources (WDNR), and is currently in discussion with the WDNR regarding potential alternative remediation strategies going forward. The Company believes that the current pump and treat strategy is appropriate for the site. At this time, the outcome of the review in terms of approach and future costs is unknown, but a change in the current remediation strategy, depending on the alternative selected, could require an increase in the currently recorded liability, with an offsetting charge to operations in the period recorded.

The Company has agreements with unrelated third parties that provide for the payment of license fees and royalties on the sale of certain products. Royalty expense, recorded in sales and marketing, under the terms of these agreements was $2,795,000, $2,876,000 and $2,659,000 for fiscal years 2019, 2018 and 2017, respectively. Some of these agreements provide for guaranteed minimum royalty payments to be paid each fiscal year by the Company for certain technologies. Future minimum royalty payments are as follows: 2020—$183,000, 2021—$191,000, 2022—$114,000, 2023—$109,000 and 2024—$109,000.

Neogen leases office and manufacturing facilities under non-cancelable operating leases. Rent expense for fiscal years 2019, 2018 and 2017 was $871,000, $799,000 and $729,000, respectively. Future fiscal year minimum rental payments for these leases over their remaining terms are as follows: 2020—$1,112,000, 2021—$810,000, 2022—$297,000, 2023—$101,000, and 2024 and later—$0.

The Company is subject to certain legal and other proceedings in the normal course of business that, in the opinion of management, should not have a material effect on its future results of operations or financial position.

8. Defined Contribution Benefit Plan

The Company maintains a defined contribution 401(k) benefit plan covering substantially all domestic employees. Employees are permitted to defer compensation up to IRS limits, with Neogen matching 100% of the first 3% of deferred compensation and 50% of the next 2% deferred. Neogen's expense under this plan was $1,361,000, $1,325,000, and $1,259,000 in fiscal years 2019, 2018 and 2017, respectively.

9. Segment Information

The Company has two reportable segments: Food Safety and Animal Safety. The Food Safety segment is primarily engaged in the development, production and marketing of diagnostic test kits and related products used by food producers and processors to detect harmful natural toxins, foodborne bacteria, allergens and levels of general sanitation. The Animal Safety segment is primarily engaged in the development, production and marketing of products dedicated to animal safety, including a complete line of consumable products marketed to veterinarians and animal health product distributors; this segment also provides genomic identification and related interpretive bioinformatic services. Additionally, the Animal Safety segment produces and markets rodenticides, disinfectants, and insecticides to assist in the control of rodents, insects and disease in and around agricultural, food production and other facilities.

Neogen's international operations in the United Kingdom, Mexico, Brazil, China and India originally focused on the sales and marketing of our Food Safety products, and each of these units reports through the Food Safety segment. In recent years, these operations have expanded to offer the Company's complete line of products and services, including those usually associated with the Animal Safety segment such as cleaners, disinfectants, rodenticides, insecticides, veterinary instruments and genomics services. These additional products and services are managed and directed by existing management and are reported through the Food Safety segment.

The accounting policies of each of the segments are the same as those described in Note 1.

Segment information is as follows:

(in thousands)	Food Safety	Animal Safety	Corporate and Eliminations (1)	Total
Fiscal 2019				
Product revenues to external customers	$190,675	$ 148,764	$ —	$339,439
Service revenues to external customers	22,799	51,948	—	74,747
Total revenues to external customers	213,474	200,712	—	414,186
Operating income (loss)	39,020	33,875	(4,801)	68,094
Depreciation and amortization	9,525	8,099	—	17,624
Total Assets	206,267	221,950	267,523	695,740
Expenditures for long-lived assets	8,916	5,745	—	14,661
Fiscal 2018				
Product revenues to external customers	$174,553	$ 156,735	$ —	$331,288
Service revenues to external customers	19,924	46,718	—	66,642
Total revenues to external customers	194,477	203,453	—	397,930
Operating income (loss)	34,561	39,529	(3,896)	70,194
Depreciation and amortization	9,083	7,975	—	17,058
Total Assets	186,570	220,629	210,810	618,009
Expenditures for long-lived assets	10,538	10,408	—	20,946
Fiscal 2017				
Product revenues to external customers	$154,431	$ 148,717	$ —	$303,148
Service revenues to external customers	15,603	39,526	—	55,129
Total revenues to external customers	170,034	188,243	—	358,277
Operating income (loss)	33,971	34,841	(3,867)	64,945
Depreciation and amortization	7,088	7,603	—	14,691
Total Assets	190,895	210,927	126,587	528,409
Expenditures for long-lived assets	10,332	4,246	—	14,578

(1) Includes corporate assets, including cash and cash equivalents, marketable securities, current and deferred tax accounts, and overhead expenses not allocated to specific business segments. Also includes the elimination of intersegment transactions and non-controlling interests.

The following table presents the Company's revenue disaggregated by geographical location:

	Year ended May 31	
	2019	2018
	(in thousands)	
Revenues by Geographic Location		
Domestic	$248,304	$248,236
International	165,882	149,694
Total revenue	414,186	397,930

10. Stock Repurchase

In October 2018, the Company's Board of Directors passed a resolution canceling the Company's prior stock buyback program, which had been approved in December 2008, and authorized a new program to purchase, subject to market conditions, up to 3,000,000 shares of the Company's common stock. In December 2018, the Company purchased 50,000 shares under the new program in negotiated and open market transactions for a total price, including commissions, of $3,134,727. Shares acquired under the program have been retired.

11. Summary of Quarterly Data (Unaudited)

	Quarter Ended			
(in thousands, except per share)	August 2018	November 2018	February 2019	May 2019
Total Revenue	$99,626	$107,098	$97,700	$109,762
Gross Margin	46,729	50,033	44,628	50,530
Net income	15,237	16,051	13,073	15,815
Basic net income per share	0.29	0.31	0.25	0.31
Diluted net income per share	0.29	0.31	0.25	0.30

	Quarter Ended			
(in thousands, except per share)	August 2017	November 2017	February 2018	May 2018
Total Revenue	$94,209	$100,698	$94,903	$108,120
Gross Margin	44,924	48,249	44,601	48,498
Net income	11,936	17,153	16,581	17,545
Net income attributable to Neogen	11,914	17,100	16,586	17,545
Basic net income per share	0.23	0.33	0.32	0.34
Diluted net income per share	0.23	0.33	0.32	0.33

Quarterly net income per share is based on weighted-average shares outstanding and potentially dilutive stock options for the specific period, and as a result, will not necessarily aggregate to total net income per share as computed for the year as disclosed in the consolidated statements of income.

EXHIBIT 21
SUBSIDIARIES OF THE REGISTRANT
NEOGEN CORPORATION AND SUBSIDIARIES
May 31, 2019

	WHERE INCORPORATED	PERCENTAGE OWNED BY NEOGEN CORPORATION
Acumedia Manufacturers, Inc.	Michigan	100%
Chem-Tech, Ltd.	Michigan	100%
GeneSeek, Inc.	Nebraska	100%
Hacco, Inc.	Michigan	100%
Lab M Holdings	England, United Kingdom	100%
Neogen Australasia Pty Limited	Brisbane, Australia	100%
Neogen Canada	Ontario, Canada	100%
Neogen do Brasil Productos Para Labratories LTDA.	Sao Paulo, Brazil	100%
Neogen Europe Limited	Scotland, United Kingdom	100%
Neogen Latinoamerica S.A.P.I. DE C.V.	Mexico City, Mexico	100%
Neogen Bio-Scientific Technology (Shanghai) Co., Ltd.	Shanghai, China	100%
Neogen Food and Animal Security (India) PVT, LTD	Kerala, India	100%
Neogen Properties, LLC II	Michigan	100%
Neogen Properties, LLC III	Michigan	100%
Neogen Properties, LLC V	Michigan	100%
Neogen Properties, LLC VI	Michigan	100%
Neogen Properties, LLC VII	Nebraska	100%
Preserve International	Nevada	100%
Quat-Chem Ltd.	England, United Kingdom	100%
Rogama Industria Comercio Ltda.	Sao Paulo, Brazil	100%

All subsidiaries listed above are included in the consolidated financial statements of Neogen Corporation.

EXHIBIT 23
Consent of Independent Registered Public Accounting Firm

Neogen Corporation
Lansing, Michigan

We hereby consent to the incorporation by reference in the Registration Statement on Form S-8 (No. 333-184176) of Neogen Corporation of our reports dated July 30, 2019, relating to the consolidated financial statements, and the effectiveness of Neogen Corporation's internal control over financial reporting, which appear in this Form 10K.

/s/ BDO USA, LLP

Grand Rapids, Michigan
July 30, 2019

EXHIBIT 24
POWER OF ATTORNEY APPOINTING
JOHN E. ADENT AND STEVEN J. QUINLAN

Power of Attorney

Each of the undersigned, in his/her capacity as a director, officer, or both, of Neogen Corporation, appoints John E. Adent and Steven J. Quinlan, or either of them, to be his/her true and lawful attorney to execute in his/her name, place and stead, a Report on Form 10-K for the year ended May 31, 2019 and to file the same with any exhibits or amendments thereto and other documents in connection therewith, with the Securities and Exchange Commission. John E. Adent and Steven J. Quinlan shall have full power and authority to do and perform in the name and on the behalf of each of the undersigned, in any capacity, every act required or necessary to be done as fully as each of the undersigned might or could do in person.

Signature	Title	Date
/s/ John E. Adent John E. Adent	President & Chief Executive Officer (Principal Executive Officer)	July 30, 2019
/s/ Steven J. Quinlan Steven J. Quinlan	Vice President & Chief Financial Officer (Principal Financial Officer)	July 30, 2019
/s/ James L. Herbert James L. Herbert	Chairman of the Board	July 30, 2019
/s/ William T. Boehm, Ph. D. William T. Boehm, Ph.D.	Director	July 30, 2019
/s/ James C. Borel James C. Borel	Director	July 30, 2019
/s/ Ronald D. Green, Ph. D. Ronald D. Green, Ph.D.	Director	July 30, 2019
/s/ G. Bruce Papesh G. Bruce Papesh	Director	July 30, 2019
/s/ Jack C. Parnell Jack C. Parnell	Director	July 30, 2019
/s/ Thomas H. Reed Thomas H. Reed	Director	July 30, 2019
/s/ James P. Tobin James P. Tobin	Director	July 30, 2019
/s/ Darci L. Vetter Darci L. Vetter	Director	July 30, 2019

EXHIBIT 31.1
13a. – CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
NEOGEN CORPORATION AND SUBSIDIARIES

I, John E. Adent, certify that:

1. I have reviewed this Annual Report on Form 10-K for the period ended May 31, 2019 of Neogen Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) designed such disclosure controls and procedures or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared; and

    b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles; and

    c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting to the registrant's auditors and the audit committee of the registrant's board of directors:

    a) all significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: July 30, 2019

/s/ John E. Adent
John E. Adent
President & Chief Executive Officer
(Principal Executive Officer)

EXHIBIT 31.2
13a. – CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
NEOGEN CORPORATION AND SUBSIDIARIES

I, Steven J. Quinlan, certify that:

1. I have reviewed this Annual Report on Form 10-K for the period ended May 31, 2019 of Neogen Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) designed such disclosure controls and procedures or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared; and

    b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles; and

    c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting to the registrant's auditors and the audit committee of the registrant's board of directors:

    a) all significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: July 30, 2019

/s/ Steven J. Quinlan
Steven J. Quinlan
Vice President & Chief Financial Officer
(Principal Financial Officer)

EXHIBIT 32
18 U.S.C. SECTION 1350 CERTIFICATION
NEOGEN CORPORATION

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with this Annual Report on Form 10-K of Neogen Corporation (the "Company") for the period ended May 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, John E. Adent, as Chief Executive Officer and I, Steven J. Quinlan, as Chief Financial Officer, hereby certify pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) This Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) Information contained in this Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: July 30, 2019

/s/ John E. Adent
John E. Adent
President & Chief Executive Officer
(Principal Executive Officer)

/s/ Steven J. Quinlan
Steven J. Quinlan
Vice President & Chief Financial Officer
(Principal Financial Officer)

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.