

# Evolving a Sustainable Future

Primal is part of a group of Companies dedicated to establishing themselves as lead organizations, driving change to create a more tenable future for our planet by ensuring environment protection, social responsibility and value creation, for generations to come.

A world beset with new challenges requires innovative thinking and a more imaginative approach. Sustainable businesses will be the only survivors in a world with rising environmental challenges, public awareness and accountability.

#### **Primal**

- · The very first, original
- · Primary in its priority
- Primitive in its simplicity
- Pristine in its purity
- · Paramount in its importance

Alternative investment specialists in emerging markets, Primal Group focuses on the solutions needed to sustain a global population racing away to over 10 billion by 2050. By focusing on the Primal needs of man, our aim is to provide a lower risk profile offering better rewards than traditional asset classes

In a world demanding and deserving of higher social responsibility, sustainable business will ensure a more conscious and profitable future for us all.

Welcome to Our World.

# Meet Our Senior Management Team



Anthony J. Archer
Chairman & CEO

A futurist mindset entrepreneur and thought leader with multiple industries experience, having created and worked on several hundred million dollars of projects across the EU, MENA and LATAM regions. Anthony (42) creates business strategies with a focus on moral, ethical and social responsibility. He is tenacious in his determination to provide positive change through his business endeavors. The approach is to use his unique and holistic perception of economics, politics, human behavior and technology to provoke, adapt and improve our planet, making commerce a force for good that will result in improved and more sustainable lives for future generations, whilst generating ethical profit. A Singularity University (NASA Ames) Executive Graduate, driven by the tangible personal goal of positively impacting the lives of over 1 billion human beings through innovation, and execution, of exponential ideas.



Andrew J. Goodman

A straight-talking, yet amiable economics graduate, Andrew (40) started his career in the investment industry in one of the largest privately owned property investment companies in the U.K., followed by three years in the Middle East, before utilizing his fluency in both Portuguese and Spanish, based out of the group's office in Brazil for six years, and now Mexico City. His extensive "boots on the ground" experience of our projects grants Andrew an unparalleled understanding of the day-to-day challenges of, and the multiple opportunities available, in the fast-growth environment of Latin America, which enables him to aid our business in a unique manner.

Andrew is a strong communicator, relationship builder, and resource for both our internal team and our investors.



Paloma Escandón
Chief Implementation Office

A determined trailblazer, Paloma (39) gained decision making and managing skills through years of professional aviation as a pilot, focusing on safety, attention to detail, and personnel training. She then decided to pursue her environmentalist conviction to securing a sustainable future and earned an executive degree in conservation and environmental sustainability at Columbia University's Earth Institute. Paloma furthered her development implementing projects and programs for socially responsible companies. During this time, she joined Primal Group, convinced that sustainability is only achievable through a correct and profitable business model. Today, Paloma meticulously helps us navigate the different ways to implement our mission with the most integral strategies. With a future of accelerating change in mind. in 2018 she attended Singularity University (NASAAmes) to understand the exponential technologies that will disrupt our industry and how to apply them to future proof our business.

# Meet Our Management Team



Henrique dos Santos Chief Agronomist

A graduate of the University of São Paulo with a degree in Agronomic Engineering, Henrique (30) has experience well beyond his years, managing large scale commercial plantations (20,000+ ha.) across multiple countries in Latin America and Africa. Henrique is sufficiently experienced to lead our agronomy team and youthful enough to embrace continued learning. With a specialized focus in applying sustainability methodology in order to deliver global change and maximum commercial value, he advocates and actively utilizes the latest agro-ecological and cost effective systems of production to achieve the highest vields. Passionate about venture capital dedicated to agriculture, he is now focusing on implementation, expansion and delivery of our vertically integrated project, along with the origination and recording of unique intellectual property regarding commercial-scale neem production and use, within modern agriculture.



Carmen Lops
Marketing Manage

Responsible for the marketing efforts of Primal Group, Carmen (29) brings multi-industry experience to expand and evolve our commercial initiatives around the world. With professional experience across renowned global multinationals like Volkswagen. Bosch and Bain & Company, and an ever-evolving knowledge of cutting edge and innovative marketing strategies, Carmen brings a modern and dynamic approach to our marketing activities, maintaining the position of our company at the intersection of sustainability and innovation. Passionate about the company's vision to make a positive global impact, Carmen strives to actively engage audiences with our philosophy in order to ensure social responsibility and better selfgovernance across society in critical global issues at all levels.

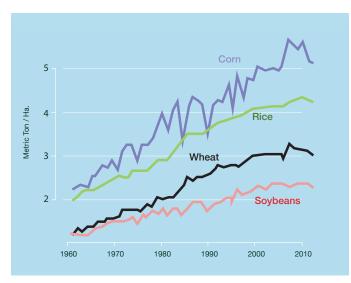


#### Maximilian Schwartz

First obtaining a Bachelor's degree from the University of Berlin, Max (29) then graduated with a Master's degree in Economics from the Fudan University in Shanghai. Having gained intercultural experience. while working for private agencies as well as government institutions. Max is equipped with a diverse range of skills. He is well versed in the development and communication of corporate strategy through sound analysis and a diplomatic approach. Utilizing his out-of-the-box thinking and strategic management skills. he is now responsible for the operational efficiency of Primal Group. Max is driven by a passion for developing efficient systems that maximize organizational productivity and implementing global strategies that emphasize stronger environmental, social and corporate governance criteria.

#### The Green Revolution: Malthus Revisited

#### **Global Yields of Staple Food Crops Have Peaked**



Source: UN Food and Agricultural Organization. Agriculture Towards 2050 (2012)

"The power of population is so superior to the power of the earth to produce subsistence for man, that premature death must in some shape or other visit the human race"

- Malthus TR. An Essay on the Principle of Population (1798)

In his seminal work, Thomas Malthus highlighted that unprecedented levels of population growth would use up all available resources and lead to unimaginable amounts of famine and disease. This was known as the Malthusian Catastrophe.

Over time, man's resilience and ingenuity allowed him to overcome Malthus' predictions. Much of this was thanks to the immense advances in agriculture fostered by the Green Revolution.

In the early 20th Century, the discovery of synthetic pesticides and fertilizers, as well as the introduction of hybrid seeds and extensive irrigation infrastructure, led to dramatic yield breakthroughs worldwide and saved one billion people from starvation.

It took almost 1,000 years for wheat yields to increase from 0.5 to 2 metric tons per hectare, but only 40 years in the 20th Century to climb from 2 to 6 metric tons per hectare.1

#### The Green Revolution & Why We Need a New One

The Green Revolution of the 1960s was fundamental to meeting a major threat to the survival of the global population. Now the world is facing new challenges:

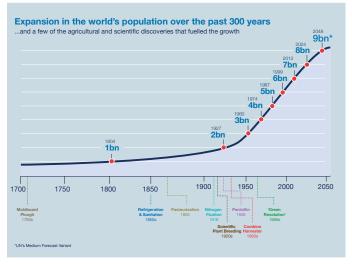
**Population growth is unrelenting** – Population is growing unrelenting and is expected to peak at nearly 11 billion by the end of this century.<sup>2</sup>

**Arable land is in decline** – In 1970 each person had the equivalent of 0.38 hectares of arable land, and this is expected to decline to 0.15 ha/person by 2050. At least 0.49 ha/person is needed to maintain current dietary standards.<sup>3</sup>

**Crop yields have peaked** – Global crop production yields will need to double by 2050 to meet rising demand.<sup>4</sup>

**So much food is wasted** – Up to 40% of food grown in the US is uneaten and goes to waste.<sup>5</sup>

The intensive investment in utilizing science for agriculture during the Green Revolution revolutionized agricultural practices worldwide yet it is increasingly raising issues that are affecting both the environment and society. The culprits are an over-reliance on synthetic pesticides, chemical fertilizers and antibiotics used in raising livestock.



Source: The Atlantic and Allianz SE. The 50 Greatest Breakthroughs Since the Wheel (2013)

#### Pesticides: Friend or Foe?

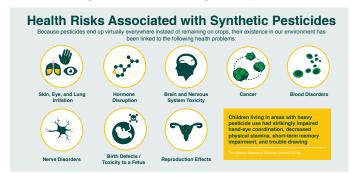
Pesticides are essential for the survival of the human race. By increasing crop and livestock yields, heightening food safety and improving human health, they ensure productivity and our security. Without them, we wouldn't be able to produce enough food for the planet. Although up to 40% of the world's crop production is already lost annually, 6 due to the effects of weeds, pests and disease, crop losses would double if the use of pesticides were abandoned.

Between 1960 and 1990 extensive pesticide use contributed to crop yields increasing by 98% world-wide.8

While synthetic pesticides aid farmers by preventing crop losses, the negative effects they have on human health and the environment can be catastrophic.

- 98% of sprayed pesticides and 95% of herbicides come into contact with a destination other than their intended target.<sup>9</sup>
- Pesticides can enter the body through inhalation, by consumption of contaminated food and water, and through direct contact with the skin.
- There are up to 3 million cases of serious pesticide poisoning worldwide documented each year<sup>10</sup>, responsible for up to 250,000 deaths.<sup>11</sup>

Synthetic pesticides have been widely linked to a range of human hazards that range from short-term to long-term impacts:



Source: Environmental Protection Agency. Pesticides Health and Safety (2014)

# Financial Impact of Synthetic Pesticides in the US Total Cost US\$ 9.3 Billion Public Health Impacts Groundwater Contaimination Government Regulations

Source: Pimentel, D. & Peshin, R. Integrated Pest Management: Pesticide Problems (2014)

# Fertilizers: The Good, the Bad and the Ugly

Arable land, as a finite resource, has been under pressure to supply enough food for a rising population thereby making fertilizer use essential in increasing agricultural productivity. Globally, in the three decades to 2015, the 'carrying capacity' of the world's soils has jumped from 1.9 people per hectare of farmland to 4.3 people per hectare.

The global organic fertilizers market is anticipated to reach US\$ 6.3 billion by the end of 2024 from US\$ 3.1 billion in 2016.12

The use of synthetic fertilizers can benefit plant growth and help to achieve optimal yields, but their excessive use can also be a danger to society.

#### **Synthetic Fertilizers:**

- Damage public health<sup>13</sup>
- Lead to lower yields in the long-term<sup>14</sup>
- Increase pollution<sup>15</sup>
- · Kill a significant percentage of beneficial microorganisms16

More than **80% of China's groundwater is heavily polluted and is unfit for drinking.** A major culprit is excessive fertilizer use.<sup>17</sup>



There
has been
a 10% loss of
plant diversity over
two-thirds of Europe
due to the overuse
of nitrates in
fertilizers.18

# The Rising Tide of Antibiotic Resistance

Discovered less than a century ago, antibiotics are essential to the survival of human race, allowing for the treatment of many diseases previously regarded as fatal. They also enable farmers to treat and protect livestock, helping secure our food chain.

Antibiotics use for both humans and livestock has proliferated:

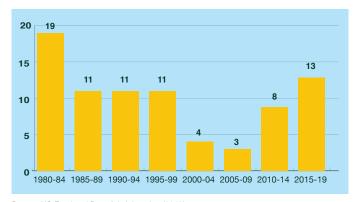
**80%** of all antibiotics in the US are given to livestock, mostly to speed their growth and prevent diseases.<sup>19</sup>

Up to **50%** of all antibiotics given to humans in the US are prescribed unnecessarily or used inappropriately.<sup>20</sup>

As microbes are constantly adapting and evolving to new environments, they can become resistant to antibiotics due to overuse. Antibiotic resistant bacteria is then easily spread between humans, animals and crops.

Pharmaceutical companies spend an average of US\$ 5 billion developing new drug and greater profits can be achieved on areas such as statins, antidepressants and anti-inflammatory medications. By comparison, antibiotics tend to be used for only a short time and are relatively cheap.<sup>21</sup>

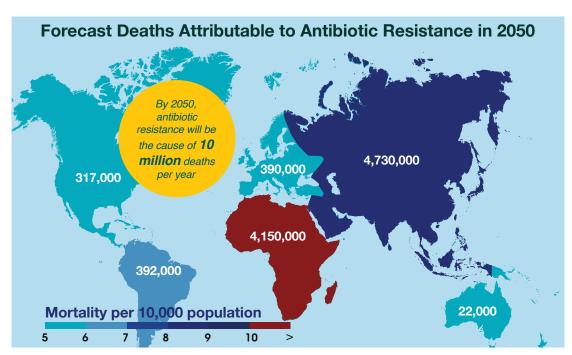
#### **Antibiotics Approved by the US Food and Drug Administration**



Source: US Food and Drug Administration (2019)

No new class of antibiotics has been discovered since the **1980s**.<sup>22</sup>

# A Return to the Dark Age of Medicine?



Only 1.6% of drugs in clinical development by world's largest drug companies in 2004 were antibiotics.<sup>23</sup> By 2018, the number of 'Big Pharma' companies with dedicated antibiotic divisions had fallen to only 3, reflecting the long term demise of the sector.<sup>24</sup>

Antibiotic resistance costs the US US\$
55 billion every year in health costs and losses in productivity.<sup>25</sup>

Source: Review on Antimicrobial Resistance. Tackling a Crisis for the Health and Wealth of Nations (2014)

### Push-Pull Factors For a Changing Landscape

Organic food is the only sustainable solution to feed an everincreasing population. Anything but organics risks further stress on our environment and the associated impact on our health. There are two factors that are changing the way we grow our resources and shifting the world away from intensive farming towards safer methods of cultivation

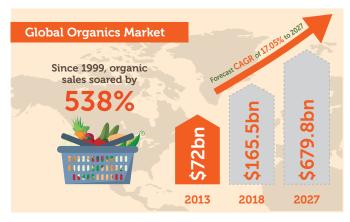
Aware of the impact of intensive farming, governments are imposing a stricter regulatory framework to protect both the environment and people's health:

- In January 2017, the FDA, through its Veterinary Feed Directive (VFD), mandated that the use of certain drugs on livestock can only be done with the approval of a vet.<sup>26</sup>
- The FDA now requires more than 100 different scientific studies to approve a new pesticide that will be used in crops.<sup>27</sup>

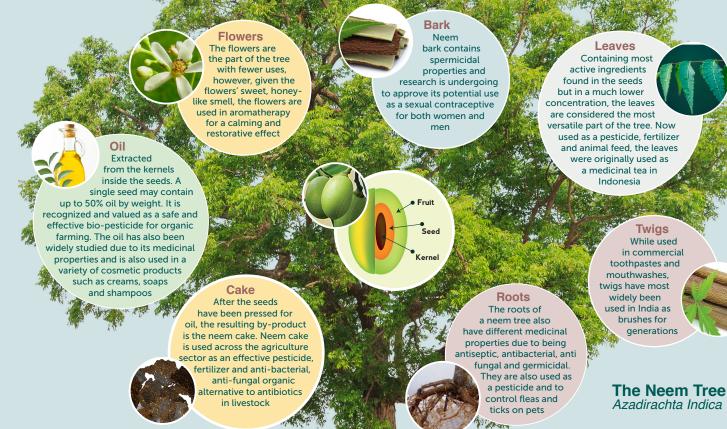
Consumer awareness on the dangers of pesticides and fertilizers and on the overuse of antibiotics is increasing forcing companies to make changes to the way they do things:

 McDonalds ceased using chickens reared with dual use antibiotics and plans to reduce the use of antibiotics in its beef supply.<sup>26</sup>

- Costco is in the early stages of implementing policies to eliminate antibiotics important to human medicine in its poultry and beef supply.<sup>29</sup>
- Walmart has asked suppliers to publicly disclose their progress in cutting antibiotic use for promoting growth in livestock.<sup>30</sup>



Source: Grandview Research. Organic Foods & Beverages Market Analysis and Segment Forecasts to 2020 (2015)



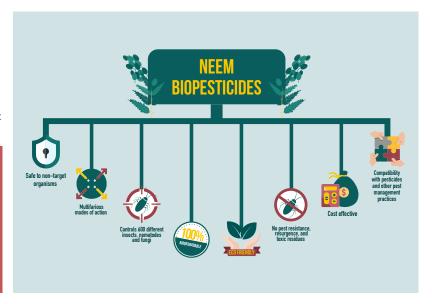
#### Azadirachtin – The Organic Alternative for Crop Protection

Neem offers an inexpensive and nontoxic alternative to a number of synthetic pesticides. Effective against 600 different types of insects, nematodes and fungi, neem oil acts on the hormonal systems of pests and therefore does not lead to the development of resistance in future generations. The ability to use neem as a pesticide that doesn't damage the soil will have a long-term positive impact on farmers and their farmland.

Azadirachtin, neem's main chemical compound, is found exclusively in the neem tree and holds the secret to sustainable crop protection in the 21st Century.

The global bio-pesticide market reached **US\$** 3.147 billion in 2018.<sup>31</sup> Forecasts place the bio-pesticide market value at **US\$** 14.94 billion in 2028, with a CAGR of 15.11%. Bioinsecticides currently account for the largest revenue share of 50.34% in the overall market by type segment, while biofungicides are anticipated to be the fastest growing when compared to other types of biopesticides.<sup>32</sup>

#### Multiple Advantages of Using Neem as a Pesticide



# Cake – An Organic By-Product that Nourishes Soil

After the seeds are crushed to produce the oil, the result is neem 'cake'. This contains the nitrogen, phosphorous and potassium for plant development and soil nourishment as well as water retention.

Neem cake, used as a fertilizer, has several benefits for both mankind and the environment:

- Non pollutant
- Non toxic
- No human health risk
- · No environmental contamination
- · Nourishes soil
- · Does not reduce biodiversity
- Positive environmental & social financial Impact

Source: The Primal Group (2020)



#### Neem's Potential in Safeguarding Health

#### A Solution to the Mosquito's Increasing Resistance

- Malaria was responsible for an estimated 405,000 deaths worldwide in 2018.<sup>33</sup>
- There is a growing resistance to anti-malarial medicines and insecticides.
- Neem is a proven and cost effective solution to malaria that works by deterring the mosquito breeding process.

# US\$ 2.7 billion was invested in malaria control and elimination efforts globally in 2018. The amount invested fell short of the US\$ 5 billion estimated to be required globally to stay on track towards the WHO's morbidity milestones. Source: World Health Organization. World Malaria Report 2019 (2019)

#### A Herbal Remedy

- Neem oil is an organic anti-fungal and anti-bacterial that is effective against a variety of viruses.
- Neem can be an effective cure for diabetes. For non-ketonic and insulin-sensitive diabetic patients, neem leaf extracts can reduce their insulin requirements by 30-50%.<sup>34</sup>
- The Department of Biochemistry and Microbiology from Rochester's Mayo Clinic have been researching neem since 2013.
   Instead of targeting the cancer cells directly, a protein – Neem Leaf Glycoprotein (NLGP) – modulates cells that are responsible for providing immunity to the body present within the tumor environment and its peripheral system.
- Neem leaves show antiretroviral activity in humans suffering with AIDS, exhibiting significant improvements in CD4T cell levels and reduced levels of anaemia for patients in preliminary trials.<sup>35</sup>



#### **Current Neem Products**

Neem-sourced products are offered by an increasing number of health and beauty suppliers, including L'Oréal, the world's largest cosmetics company and the parent of Garnier. Other well known brands offering neem-sourced products include Avon, Dr. Hauschka and A.Vogel.















## Not Enough Grown - The Supply and Demand Scenario

Though a hardy tree with deep roots and fast growing (up to four meters a year)<sup>36</sup> commercial cultivation of neem is fragmented. Indigenous to India, it thrives in semi-arid regions. Carried across the globe by Indian emigrants, the tree is now distributed across Africa, the Middle East and Australia. It was introduced in China relatively lately. with commercial plantations there only commencing in 1999.<sup>37</sup> Neem's strong environmental and agricultural benefits and on-going research into its medicinal possibilities make a persuasive case for increasing exposure to this plant and it has an important role in checking soil erosion and subsistence, particular problems in Africa and China.

Brazil's agricultural competitive advantages

- A unique climate allowing for more than one harvest every year
- The potential to double the country's current crop area
- Abundant water three times the supply of the US
- Technology savvy producers and agro industries
- Varied soils and climates encourage product diversity

Source: Economist Intelligence Unit Limited. The Global Power of Brazilian Agribusiness (2010)

Neem is ideally suited for cultivation in Brazil; the country is a top three producer of multiple crops and soft commodities, and the world's largest exporter of beef.38 The value of the country's agricultural exports increased six times between 2000 and 2013 and today Brazil is the world's 4th largest exporter of agricultural and food products.<sup>39</sup>

Neem's effectiveness as a bio-pesticide and fertilizer will be invaluable supporting the growing market for natural foodstuffs perceived as more healthy. In 2017, North America was the leading consumer of organics, with the region's organic food market valued at 48.7 billion US dollars. The global market for organic foods and beverages is expected to increase to US\$ 679.81 billion by 2027, growing at a CAGR of 17.05% up from US\$ 165.52 billion in 2018.40

Brazil's population of 212 million presents a potentially lucrative market for neem. The country's middle or upper classes, defined as those earning annual incomes between Brl 23.000 and Brl 44.000 (US\$ 5.750 to US\$ 11,000) comprise 64% of the total population and are avid consumers.41 Expenditure on higher quality food and health care will open up new localized markets for the crop.

#### The Competitive Advantage of Being Ahead of the Peak

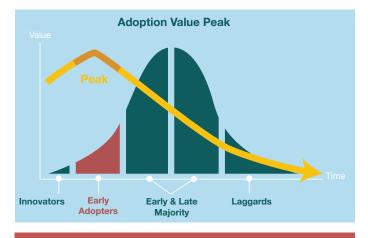
The period of maximum value and reward for owners in the investment cycle of a product is at the early adopter stage, as shown in the chart on this page. Investors in this segment can avoid much of the uncertainty, time and financial resources in getting any idea — even the good ones, beyond the concept stage. They participate once the concept is proven, and on attractive terms.

With a low investment profile but considerable potential, neem offers the opportunity for investors to participate at the peak point of the adoption value peak, allowing them to maximize the returns likely to accrue.

#### Why an Investment in Neem is Highly Attractive:

- Only discovered 60 years ago in the West, there is little commercial cultivation of neem globally at a time of fast growing applications for its diverse range of products.
- Every part of the tree, from the tip of the roots to the branches and flowers above the ground, has commercial applications and value.
- Demand for this ethical and environmentally safe product will be driven by increasing consumer preference for naturally reared produce and a tighter legislative environment on the use of synthetic pesticides, fertilizers and the overuse of antibiotics.

 The Primal Group's plantations are based in Brazil, the world's 4th largest food exporter<sup>42</sup> and a key beneficiary of the adjustments underway in global agriculture.



Now is the Time to Invest in Neem

#### **Bibliography**

- International Food Policy Research. 'Green Revolution: Curse or Blessing?' (2012).
- United Nations. 'Growing at a Slower Pace, World Population is Expected to Reach 9.7 Billion in 2050 and Could Peak at Nearly 11 Billion Around 2100' (2019).
- United Nations Food and Agricultural Organization. 'Climate Change, Water and Food Security' (2008).
- United Nations Food and Agricultural Organization. 'How to Feed the World in 2050'. (2009).
- Food and Drug Administration. 'Food Loss and Waste' (2019).
- UN Food and Agricultural Organization. 'ESA Working Paper No. 12-03' (2005).
- UN Food and Agriculture Organization. 'New Standards to Curb the Global Spread of Plant Pests and Diseases' (2019).
- FAOSTAT (2015).
- Pesticide Action Network. 'Pesticides in Our Bodies' (2015).
- Hayes W Laws E. 'Handbook of Pesticide Toxicology Vol 1 Academic Press' (1991).
- Gunnell D, Eddleston M, Phillips MR, and Konradsen F. 'The Global Distribution of Fatal Pesticide Self-Poisoning: Systematic Review'. BMC Public Health 7:357 (2007).

- Research Nester. 'Organic Fertilizers Market: Global Demand Analysis & Opportunity Outlook 2024' (2019).
- Weisenburger DD. 'Human Health Effects Of Agrichemical Use'. 24(6): 571-6 (1993).
- Dr. Mae-Wan Ho, Institute of Science in Society. 'China's Soils Ruined by Overuse of Chemical Fertilizers' (2010).
- Scientific American. 'How Fertilizers Harm Earth More Than Help Your Lawn' (2009).
- Cantoria CS. 'Soil Microbes & How Farming Practices Affect the Soil via Long Tern Fertilizations' (2010).
- The Civil Engineer Organization. 'More Than 80% of Underground Water in China Is Heavily Polluted' (2017).
- United Nations Environmental Programme. 'Excess Nitrogen in the Environment' (2014).
- Wired. 'Farm Animals Get 80 Percent Of Antibiotics Sold In US' (2010).
- Center for Disease Control and Prevention and the US Department of Health and Human Services. 'Antibiotic Resistance Threats In The United States' (2013).
- Herper M. 'The Cost of Creating a New Drug Now US\$ 5 Billion - Pushing Big Pharma To Change' (2013).
- 22. The Economist Intelligence Unit Insights. 'Careless Prescriptions, Why We Should Be

- Worried About the Use of Antibiotics' (2015).
- Perspectives in Medicinal Chemistry.
   'Antibiotics and Bacterial Resistance in the 21st Century'. 6. 25-64 (2014).
- Business Insider. 'Pharmaceutical Companies are Backing Away From a Growing Threat that Could Kill 10 Million People a Year by 2050' (2018).
- Centers for Disease Control and Prevention. 'Antibiotic Resistance Threats in the United States' (2013).
- FDA. 'FDA Reminds Retail Establishments of Upcoming Changes to the Use of Antibiotics in Food Animals' (2016).
- US Environmental Protection Agency. 'Pesticide Regulatory Program' (2015).
- McDonalds. 'Responsibly Sourced Chicken' (2019).
- 29. Costco. 'Animal Welfare' (2019)
- The Wall St Journal. 'Wal-Mart Encourages Meat and Egg Suppliers to Curb Antibiotic Use' (2015).
- Modor Intelligence. 'Crop Protection Chemicals (Pesticides) Market - North America Industry Growth, Trends and Forecasts' (2020 - 2025) (2019).
- Inkwood Research. 'Global Biopesticides Market Forecast 2020-2028' (2020).

- World Health Organization. 'World Malaria Report 2019' (2019).
- Journal of Biological Sciences. 'Neem (Azadirachta indica) and its Potential for Safeguarding Health of Animals and Humans: A Review'. 14: 110-123 (2014).
- Federation of American Societies for Experimental Biology. 'Seeking HIV Treatment Clues in the Neem Tree' (2012).
- Deutsche Welle, Global Ideas. 'Using Neem Trees to Combat Desertification' (2013).
- 37. Rediff India Abroad. 'India May Lose Neem Turf to China' (2007).
- United States Department of Agriculture.
   'Brazil Once Again Becomes the World's Largest Beef Exporter' (2019).
- Humboldt. 'Top 10 Agricultural Exporters' (2018).
- FiBL & IFOAM. 'The World of Organic Agriculture' (2019).
- McKinsey & Company. 'Mapping the Mindset of Brazil's Not-So-New Middle Class Consumers' (2015).
- Humboldt. 'Top 10 Agricultural Exporters' (2018).

