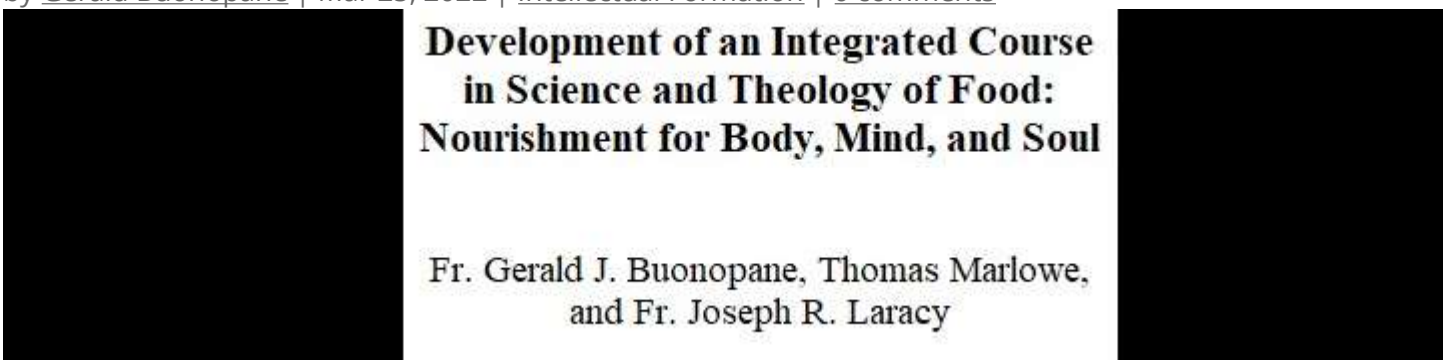
Development of an Integrated Course in Science and Theology of Food: Nourishment for Body, Mind, and Soul

by Gerald Buonopane | Mar 25, 2022 | Intellectual Formation | 0 comments



Introduction:

We report herein of a new course developed at Seton Hall University [SHU] by Fr. Gerald Buonopane, titled, *Science and Theology of Food.* The course is cross-listed between Chemistry (CHEM 3550), the University Core Curriculum (CORE 3252), and Theology (THEO 3515). The course was developed to combine three of Fr. Buonopane's main interests: food, science, and theology. It satisfies a SHU bachelor's degree graduation requirement, as discussed below, and allows students to make connections across their science, theology, or Catholic Studies major, humanities and social science general education courses, and their outside lives.

The course seeks to answer fundamental questions such as "What is food?", "What is eating?" and "What are the social aspects of eating together?", as well as exploring scientific processes, interactions, and techniques in the growing, preparation, presentation, and consumption of food and drink. The scientific aspect covers chemical, biochemical, nutritional, microbiological, engineering, sensory, and biomedical principles, including packaging, allergies, diet, and chemical interactions such as oxidation and browning reactions. Theological and philosophical topics will include biblical perspectives from the Catholic and Christian tradition together with insights from other faith traditions. Social aspects of food will cover cultural and ethnic influences and customs, including obligations and responsibilities linked to food, as well as setting and atmosphere. The ethical dimension of the course will focus on risk-benefit concerns, including food safety and hunger, and political issues such as genetically modified foods, additives, and factory farming.

The interest in developing the course was inspired by the Science and Faith in Seminary Formation for College and Pre-Theology Programs grant from the John Templeton Foundation and administered by John Carroll University (University Heights, OH). The goal of the program is to raise the "scientific literacy of clergy" and seeks the development of courses that connect branches of science with Catholic teaching. Two new courses have been developed at Seton Hall as a direct result of recent Templeton grants: a course entitled "Creation and Science" on the compatibility of the Catholic theology of creation with the natural sciences, and the course described herein on the science and theology of food. Fr. Buonopane submitted both a pre-

proposal (April 2016) and full-proposal (June 2016) for a grant to support the development of the food course and in September 2016 he was the recipient of a $10,000 grant.

The course plays a threefold purpose for the Seton Hall student. First, it satisfies the STEM requirement for the minor (college) seminarian. Seminarians need to have an appreciation of science and its relationship with faith. Second, the course satisfies the University Core III requirement (discussed in section 2), and third, the course satisfies requirements for the minor and certificate in Catholic Studies.

Based on the Science and Faith in Seminary Formation program, the initial and primary audience is the seminarian of either Seton Hall's major seminary (Immaculate Conception Seminary) or college seminary (St. Andrew's Hall). Pope Paul VI, in his 1965 "Decree on Priestly Training" (*Optatam Totius*) claims that "seminarians should be equipped with scientific training," (§ 13) and that they should be aware of the "more recent progress of the sciences" (§ 15).[1] At the start of the course we will review/examine the relationship between science and theology – i.e., how faith can work its way into the understanding of science, and vice versa. We will read *Optatum Totius*, as well as parts of Pope St. John Paul II's 1998 encyclical, *Fides et Ratio*. John Paul's words in paragraph 106 are especially pertinent: research of scientists "offers an ever greater knowledge of the universe as a whole and of the incredibly rich array of its component parts,…, with their complex atomic and molecular structures."[2] The development of this course has led to elaboration of *Science and the Theology of Food* into a course to satisfy part of SHU's general education requirements, and the rest of this paper describes that course.

Let's begin with food. Food is a ubiquitous part of our daily lives. And today more than ever we have a greater variety of foods, especially due to our global society with "ethnic" or "cultural" foods no longer just confined to their native country, but now present in global commerce, transportation, and preservation. Food comes in many forms, types and origins. We have plant foods, animal foods, fresh or natural foods, and processed foods. The latter category is enormous. We process foods in many different ways (e.g., salting, dehydration, thermal processing, freezing, irradiation). Various packaging types also add to the diversity of foods. How do processing and packaging affect the quality of food? What chemical or other scientific changes occur in a food due to processing?

Food is nourishment. Food is defined as: "*any nutritious substance that people or animals eat or drink or that plants absorb in order to maintain life and growth.*"[3] Food nourishes us physically, mentally, and spiritually. Jesus Christ is the 'Bread of Life.' He is the 'living bread that came down from heaven' (John 6:51).[4]

Physical food only serves to dampen the hunger, not to really satisfy. We are hungry people. We can only be truly nourished by Jesus Christ. Coverage of theological and religious topics will include biblical perspectives on food and food aid, Jesus Christ and food; the Mass as a sacred meal; the Eucharist; food taboos; and "feasting" and "fasting," the latter two of which have deep roots in the theological consciousness of the Church.

We all need to make wise eating choices, to choose nutritionally-rich foods as opposed to those that are nutritionally-poor. Nutritional topics will be covered, including food metabolism, special diets (vegetarianism, gluten-free, Weight Watchers, DASH, Paleo) and nutritional/eating disorders like celiac disease, anorexia nervosa, bulimia nervosa, and binge eating. Issues of hunger and malnutrition, food coping mechanisms for stress, and food consumption trends will also be discussed.

The course will cover ethical implications of food, which includes risk-benefit issues. An example here is a sugar substitute like saccharin, which in large doses causes cancer in animals. The safety of genetically modified foods, as well as the corporate and professional ethics in some current modes of its deployment will also be considered.
The rest of this paper is organized as follows: In Section 2, we provide a context for Seton Hall and its University Core Curriculum, including the need for an advanced course in the Catholic Intellectual Tradition relevant to a student's major, and in Section 3, we describe the process of developing a course in food that can be related to both science (primarily chemistry) and theology or faith, with elements from the humanities and the social sciences. Then in Section 4, we describe the specific structure of the new course and its objectives and expected learning outcomes, and in Section 5, conclusions and future directions are presented.

1. Seton Hall University's Core Curriculum

Founded in 1856, Seton Hall University is an Archdiocesan university, a Catholic institution of higher education associated with the Archdiocese of Newark. The university comprises seven schools and colleges – Arts & Sciences, Business, Education, Nursing, Diplomacy, Communication and Art, and the Immaculate Conception Seminary School of Theology, all offering both undergraduate and graduate degree and certificate programs, plus a School of Continuing Education, offering only certificates.
The University Core Curriculum, which is to be taken by all students, was adopted in 2008 and initiated in Fall 2009 with that year's entering class. The Curriculum consists of courses in three groups, together with proficiency requirements in Numeracy, Reading and Writing, Oral Communication, Critical Thinking, and Information Fluency, and a requirement that all students have a culminating experience in their major program. The first group of courses comprises three courses already required of every freshman: University Life (a 1-credit orientation and skills course), and two College English writing courses. The second consisted of two courses in the Catholic intellectual tradition, broadly understood: *Journey of Transformation*, and *Christianity and Culture in Dialogue*, to be taken in the freshman and sophomore years, respectively. These courses included readings, not only from Catholic authors over the centuries, but also from classical authors including Aristotle and Plato, from other faith traditions, and from philosophers, social scientists, and scientists from the medieval period to the present day.
The third component (CORE III, under the title of *Engaging the World*) are discipline specific courses. These courses are intended to integrate concepts and questions from the two courses of the second component with a student's own major or other area of interest. According to University Core Curriculum guidelines, the course should satisfy several requirements[5]:

- It should be taken by juniors (or seniors), requiring only *Journey of Transformation* and *Christianity and Culture in Dialogue* as prerequisites (and transitively, College English I & II).
- It should have a substantial emphasis on the concepts and questions from those courses, both in course materials and in assessment, and require readings and a paper related to that tradition.

- It should have serious intellectual content in the discipline(s) offering it, and it count toward the major program in which it is offered.

It quickly proved straightforward to create multiple courses in each department in the humanities, the social sciences, diplomacy, education, and the arts, and to develop one course each in business and nursing. Further, the University's interdisciplinary Program in Catholic Studies created and offers several such courses, most cross-listed with one or more other departments. Creating viable courses in the formal (e.g., mathematical) and natural sciences proved a much greater challenge.

1. **Development of the Course: Relationships Between Food, Science, and Theology**

Science and Theology of Food is a Core III course that will build upon the theme of transformation from Core I (*Journey of Transformation*) and the discussion about faith and science in Core II (*Christianity and Culture in Dialogue*). This course has been developed for a wide student audience: chemistry and science majors seeking a science elective, seminarians needing to satisfy their science requirement, and students from across various majors in liberal arts, humanities, communications and the arts, business and diplomacy, with some interest or background in science, to complete the third component in the Core curriculum (CORE III).

The subject course will serve a useful need at Seton Hall University since no course of its nature exists. Although a number of colleges and universities offer courses on the relationship between food and faith/theology, we are not aware of any existing course that combines the science of food with theology. The course will be beneficial to both science and non-science majors. For non-science majors, particularly to those who are required to complete a non-laboratory science course (e.g., seminary students), it may be of particular interest.

This course will examine the relationships between food and science and food and theology, as well as the relationship between food, science, and theology. Social and cultural aspects will also be considered where relevant. Each of these relationships will now be discussed, beginning with food and theology.

Fr. Buonopane's background in food science/food chemistry (Ph.D., Penn State University) and his knowledge of the Catholic Christian faith and theology and years of priestly and pastoral experience well suits him to teach the course.

Food and Theology

God gives to us a tremendous variety of food and an endless supply. Why does He do this? The freelance Catholic writer, Emily Stimpson Chapman, responds: God gives us "tasty treats that bring comfort, healing, love, and joy – the most obvious answer is because he is good and because he is love."[6] Even though we are weak, and sinners, God gives us abundant food – all the way from bacon jam to the Eucharist![7]

Food is referenced throughout the Scriptures. There are numerous references in the Bible to bread, oil, wine, fig trees, choice roasts of meat, and freshly caught fish.[8] Some examples of these Biblical references, as stated by Chapman, include: Food comforts us, it "gladdens our hearts, builds our strength" (Ps 104:15); Food nourishes, it restores our energy: Jesus says to give Jairus' daughter something to eat after He raises her from the dead (Mark 5:43, Luke 8:55); Food is the stuff of domestic sacrifice: Ruth feeds her mother-in-law Naomi from her own rations, earned by a hard day's work in the fields (Ruth 2:18); food is at the center of community and liturgical celebrations, as, for example, the wedding at Cana and its seven days of feasting (John 2:1-12); food is a gift of kindness that is offered to friends and strangers alike, as we see in

the generosity of Abraham when he offered a feast for three strangers (Genesis 18:2-5); food can seal friendships and even win over enemies as we see in 1 Samuel 16:20-21, where David's father, Jesse, gave Saul bread, wine, and a goat, thus allowing David to enter into Saul's household; and food helps to establish peace, as when Joseph softened the hearts of his jealous and hateful brothers when he welcomed them to Egypt in a time of famine (Genesis 45:4-15).[9] Norman Wirzba, research professor of theology, ecology, and rural life at Duke Divinity School, states that "food connects us to the memberships of creation and to God."[10]

In the Gospels we find Jesus often around food. In this way the Gospels point out Christ's humanity – he needs food, he gets hungry, and he likes food. Jesus enjoys sitting down to a meal in the company of friends, acquaintances, and even strangers. He beautifully portrays a joy of eating. Chapman writes of the post-resurrection appearance of Christ on Easter Sunday: "In the upper Room, as the Apostles stare aghast at the Resurrected Jesus, he asks for something to eat, proving to them that he's still flesh and blood, not a ghost or a spirit (Luke 24:41)."[11] Jesus even liked to cook food, as we see after the Resurrection when he prepared breakfast for the disciples at the seashore (John 21:12).[12] This joy of Jesus with food points to what we call the "feasting" aspect of eating. Chapman states[13]: "So much feasting went on in Jesus' presence that John's disciples protested. Why did John fast on locusts and honey, while the disciples of Jesus feasted?" Feasting, although it involves consumption, does not refer to eating to excess nor does it point to the sin of gluttony. Wirzba describes feasting in its beautiful theological sense: "[feasting] is about self-offering and the generous honoring and sharing of gifts that have been gratefully received and cherished."[14]

Probably the quintessential human food is bread.[15] Food metaphors in the Bible are abundant, particularly of bread, salt, and wine.[16] Bread is a metaphor for Jesus himself: "I am the bread of life; whoever comes to me will never hunger, and whoever believes in me will never thirst" (John 6:35).

Although we read a lot about how God generously lavishes the earth with good food, and places it at our disposal, He also establishes food boundaries. Note that He does not give *carte blanche* to Adam and Eve to eat of everything in the Garden of Eden. This brings us to a basic truth about food in the Bible: "eating can be an occasion for virtue … or an occasion for vice."[17]

We can also consider the practice of fasting from food. Fasting is an element of numerous faith traditions, particularly including Buddhism, Hinduism, Judaism, Islam, Catholicism, and the Eastern Orthodox tradition. Why fast? Controlling one's appetite can then help us control other appetites like anger, revenge, greed, praise, impurity, power, pleasure, and lust.[18] Paul Fieldhouse writes that, for the individual person, "fasting teaches patience, unselfishness, moderation, willpower, and discipline and promotes a spirit of social belonging, unity, and brotherhood."[19] Wirzba says that those who fast "learn that food is a gift and is not to be taken for granted or exploited."[20] Fasting allows us to put our focus on God and His will. Look at Jesus fasting for 40 days in the desert fighting off temptations of the Evil One.

Our discussion of food also includes when food isn't abundant or tasty. It signifies that something is missing. "Famine and hunger are the lot of a fallen, broken world. A barren land is a physical manifestation of a world without grace and without God."[21]

God wants all people to have an adequate amount of food. Those who have enough are responsible for feeding the hungry and the undernourished. All people have the right to food, food security and distribution. Data from December 2016 indicates according to the United Nations Food and Agriculture Organization that about 800 million people of the 7.3 billion

people in the world, or one in nine, are suffering from chronic undernourishment in 2014-2016. Almost all the hungry live in developing countries, representing 12.9 percent, or one in eight, of the population of those countries.[22]

Much of the food harvested and produced is, sadly, wasted. According to an IFT Scientific review, "as much as half of the food grown and harvested in underdeveloped and developing countries never gets consumed, partly because proper handling, processing, packaging, and distribution methods are lacking. Starvation and nutritional deficiencies in vitamins, minerals, protein, and calories are still prevalent in all regions of the world, including the United States."[23] We know well Jesus' view on food wastage from the passage in John's Gospel on the multiplication of the loaves: "When they had had their fill, he said to his disciples, 'Gather the fragments left over, so that nothing will be wasted'" (John 6:12).

Another meaning ascribed to food in both the Old and New Testament is that food saves. We see this in the Passover meal of the Israelites where eating leads to freedom, it is a ticket to new life, a mechanism for deliverance. The people are to eat the meal of roasted lamb with unleavened bread and bitter herbs "like those in flight" (Exodus 12:8, 11). The Passover foreshadows an entirely different kind a meal, a meal that is a means of salvation and a thanksgiving for salvation – the Lamb's Supper, the Eucharistic Meal.[24] We have Jesus' words of institution (consecration): 'This is my body, which will be given for you' … 'This cup is the new covenant in my blood, which will be shed for you' (Luke 22:19-20). Passover and the Eucharist are religious and cultural obligations as well as celebrations and commemorations—and in the case of the Holy Eucharist, a Sacrament.

Although emphasis will be placed on food in the context of Christianity and its Jewish forbears, we cannot neglect discussion of the importance of food in other religions and faith traditions. The worship of God by many Old Testament figures, from Cain and Abel, to Noah, to the patriarchs, to the offering of Melchizedek, to Jethro the priest of Midian, to the ratification of the Mosaic covenant by sacrifice before the tabernacle was built, involved many food offerings and sacrifices.

We also have examples of food offerings to the gods in various other religions. They are omnipresent in Hinduism, folk Taoism, Vodoun (Voodoo) and Santeria.[25] The month-long Ramadan fast (from dawn to sundown each day) and corresponding feasts are one of the pillars of Islam. Fieldstone writes that Ramadan "invokes empathy and compassion for the hungry and underprivileged people of the world and is a social leveler, applying to rich and poor alike."[26] Food is an important part of the two-day joyous Mexican festival, Day of the Dead (Dia de los Muertos). The souls of the faithful departed are welcomed with food and drink, with home altars "loaded with fruits and nuts, tortillas, and a special sweet egg bread called *pan de muertos*, made with fruit and alcohol such as tequila and decorated with sugar glaze."[27] Fasts are also important if hard to document historically in Native American religions, as are the gift-giving potlatch feasts in the Northwest, the food at which is abundant. In fact, potlatches are a form of competitive feasting in which the hosts of the food vie to exceed each other in generosity.[28]

Food and Science

Fresh foods (particularly fruits and vegetables) are breathing and living organisms. Chemical reactions and microbiological changes proceed particularly in fresh food. Like the human person, food is composed of mostly of carbon, hydrogen, and oxygen. Food also has sufficient amounts of nitrogen, phosphorus, and sulfur. The subjects of food chemistry and food

microbiology tell us a lot about food. For example, food chemistry helps to explain why and how a food browns or turns rancid, resulting in off-flavors and off-odors. Food microbiology explains how and why particular microorganisms – bacteria, molds, and yeasts – pathogenic or non-pathogenic – grow in a food product. Intrinsic and extrinsic parameters of food, such as pH, moisture content, and temperature, affect chemical and microbiological changes. And food chemistry and microbiology also tell us how food transforms as it is cooked, for example, from poisonous to safe, or from indigestible to edible. In other cases, as with grilled meat, cooking increases not only sensory appeal but also cancer risk (high cooking temperatures may promote formation of cancer-causing chemicals). Particularly due to current consumer demand, the food industry and food research institutions (academic, government, and private) are heavily engaged in food product development, food processing, and food packaging (e.g., aerosol containers) activities.

Part of the food and science association is the nutritional and health qualities of food. Of course, we all need to take in (physical) food every day, particularly a variety of foods, so that our body receives all of the essential nutrients it needs. Culture is an important factor in influencing our food choices.

To live a healthy lifestyle means to consume a well-balanced diet of both major (e.g., protein and fat) and minor (e.g., vitamins and minerals) nutrients. So much has been said of the overall poor eating habits of Americans, so many of whom consume diets high in sugar, fat, and calories. Thus, the high incidence of obesity and diseases of the heart, hypertension, as well as diabetes and cancer. To correct their poor eating habits many people choose a particular dietary regimen like a vegetarian or vegan (i.e., no consumption of animal products) diet or Weight Watchers.

The safety of our food supply is a critical concern. There may be toxicants in food that are naturally present (e.g., safrole in sassafras and black pepper, suspected to have carcinogenic properties) or toxicants that result from processing (e.g., lysinoalanine in pretzel and snack food manufacturing, suspected to be toxic to kidneys).

Our foods have changed over thousands of years through interaction with humans, via natural and artificial selection, probably nowhere more so than in the evolution of maize.[29] Much more recently, a particular food processing method of sorts – genetic modification – is being watched closely for safety issues. In genetically modified food genetic characteristics have been directly modified in order to give it a new property, such as enhanced nutritional content, texture, color, flavor, growing season, yield, disease or pest resistance, or herbicide resistance. The most common GM crops and purpose for genetic modification include cotton and corn (insect resistance); alfalfa, canola, and soybean (herbicide resistance); potato (virus resistance), and tobacco (nicotine reduction).[30]

Food, Theology, and Science

How do we now bring all three topics – food, theology, and science – together? One way we can do this is to look at the most basic principle of the Christian moral life: awareness that every person bears the dignity of being made in the image of God. We are all called to act morally. Applying this call to food and science mandates that our foods are safe and efficacious, that there is enough food for all, and that food labeling be truthful and honest. Food manufacturers must not adulterate or misbrand food.

Genetic modification can potentially change a number of food properties, including toxicity, allergenicity, possible antibiotic resistance from GM crops, carcinogenicity from consuming GM

foods, and alteration of nutritional quality.[31] The World Health Organization has concluded that GM foods currently on the international market have passed risk assessments – "they are not likely to present risks for human health. Furthermore, no effects on human health have been shown as a result of the consumption of GM foods by the general population in the countries where they have been approved."[32]

When discussing our food supply, we must consider ethical implications and risk-benefit issues of food. For example, why is a non-nutritive sweetener like saccharin still being added to food when animal studies show it to cause bladder cancer in rats? The safety of genetically modified foods is particularly pertinent. Consider apples, for example, a fruit that is frequently mentioned in Scripture. In 2015 the U.S. Department of Agriculture approved the first genetically modified apple for sale in the U.S. The modified apple resists browning when cut open or sliced, a trait that makes it useful for restaurants, grocery stores, airlines and other companies that offer pre-sliced fruit. That's a great benefit. But, what may be the risks, particularly health risks? And does genetically modifying a food tinker with God's plan for creation? Also, are there are other risks in the deployment of these crops?

Pope Francis, in his encyclical letter, *Laudato Si' (On Care for our Common Home)*, acknowledges that "no conclusive proof exists that GM [foods] may be harmful to human beings."[33] However, from more of an ethical standpoint, the Holy Father cites "significant difficulties [with GM foods] which should not be underestimated. In many places, following the introduction of these crops, productive land is concentrated in the hands of a few owners due to 'the progressive disappearance of small producers, who, as a consequence of the loss of the exploited lands, are obliged to withdraw from direct production'. The most vulnerable of these become temporary laborers, and many rural workers end up moving to poverty-stricken urban areas."[34] Genetic modification becomes a "technological yoke" that ensures poor farmers become reliant on western seed companies, such as Monsanto and DuPont. The great issue is how the small farmer in the developing world (particularly in sub-Saharan Africa, Asia, Latin America, and the Caribbean) can pay for the GM seeds?

How well as a global community are we following Jesus' words, "For I was hungry, and you gave me food, I was thirsty and you gave me drink" (Mt 25:35)? According to the document of the United States Conference of Catholic Bishops, *For I Was Hungry & You Gave Me Food: Catholic Social Teaching and Agriculture*, "Every person has a right to life and to the material and spiritual support required to live a truly human existence. The right to a truly human life logically leads to the right to enough food to sustain a life with dignity."[35]

Pope Francis, in an address to the Food and Agriculture Organization on June 11, 2015, focused on three main points for achieving food security: 1) reduce food waste; 2) educate people to practice wholesome nutrition; and 3) foster an attitude of genuine and effective solidarity to promote and achieve real food security for all and for everyone.[36] Certainly, issues like food security and sustainability fall within the interface of food, faith, and science.

Food in the Humanities and Social Sciences

Because food lends itself to be so interdisciplinary, it is not surprising that nearly every discipline in the social and natural sciences as well as quite numerous humanities disciplines (art, history, and media studies, most notably) have robust areas of scholarship related to food and agriculture. Food is on the mind of everyone. Who doesn't talk about food? In her blog post, Allison Carruth, an Associate Professor in the Department of English at UCLA, writes: "food and agriculture are rich subjects of inquiry for literature scholars and, as a corollary, that 'we'

[literature scholars] have much to offer food studies. I should note here that food writing may be among the most popular genres of contemporary nonfiction and speaks centrally to questions of interest to the humanities—identity, globalization, power, aesthetics, social media, and the list goes on."[37] Just pick up the daily paper or a non-food magazine and the chances are good that you will find quite a number of articles on food. A few recent examples of articles, include two book reviews from *The Wall Street Journal*, titled "Salumi [Italian cold cuts predominantly made from pork] Coast to Coast" (by Max Watman) and "Drink To Me Only With Thine Eyes" (by Rachel Laudan, about "gastrophysics," a new area of sensory science in which the mind, not the mouth, creates taste and flavor by integrating information from all the senses). A June 2017 supplement in *USA Today* in partnership with Mediaplanet on the topic "Tackling Hunger" contained articles titled "Making the Fight Against Hunger a Global Priority," "Minimizing Food Loss on the Farm and Beyond," and "The Problem of Hunger and How Food Banks Can Help," among others.

Literary giants like William Shakespeare (1564-1616) and Marcel Proust (French novelist and essayist, 1871-1922) have often referenced food in their writings. In "Shakespeare's time, the English people were plenty hungry. The country saw at least 40 food riots between 1586 and 1631."[38] In *A Midsummer Night's Dream* (c. 1595), "Titania, the fairy queen, has a theory about why [the authority] can't get it together: fog, flood, village greens 'filled up with mud,' the 'drowned field,' and the young corn [wheat or barley] that 'rotted' before it ripened."[39]

In Shakespeare's play, *Coriolanus (c. 1605)*, "based on the life of the legendary Roman [resistance] leader Caius Marcius Coriolanus, [the play] opens with citizens armed with 'staves, clubs, and other weapons' in protest against the city fathers they accuse of hoarding grain while the populace starves. [Coriolanus] insists he fights 'in hunger for bread, not thirst for revenge' — even as he rallies the masses to rebellion 'rather to die than to famish.'[40]

Many of us have vivid memories of food from our younger days. I often think back to my mother's cooking. Although she prepared such delicious pasta and tomato 'gravy' and other Italian dishes, I often reflect on her wonderful chicken soup and her baked chicken with a slight lemon seasoning. Marcel Proust gives us a good example of how food can serve as a lasting memory of life. Proust's masterpiece, *À la recherche du temps perdu* (*In Search of Lost Time*, 1913), is filled with brilliant, minutely described accounts of food and drink drawn from his vivid memories. Proust writes: "When from the distant past nothing remains, after the beings have died, after the things are destroyed and scattered, still, alone, more fragile, yet more vital, more insubstantial, more persistent, more faithful, the smell and taste of things remain poised a long time, like souls, ready to remind us, waiting and hoping for their moment, amid the ruins of everything else; and bear unfaltering, in the tiny and almost impalpable drop of their essence, the immense architecture of memory. Yet again I had recalled the taste of a bit of madeleine dunked in a linden-flower tea which my aunt used to give me (although I did not yet know and must long await the discovery of why this memory made me so happy), immediately the old gray house on the street where her room was found, arose like a theatrical tableau…"[41]

1. **The Course: Ingredients and Structure; Objectives and Learning Outcomes**

Two textbooks will be required for the course in addition to various online and print resources. For the discussion on food and science, we will use *Food Science: An Ecological Approach* by Sari Edelstein, retired professor at Simmons College, which is designed for students with little or no previous study on the topic. In light of Pope Francis' Encyclical

Letter, *Laudato Si'*, it is appropriate to examine food from an ecological approach. For discussing the association of food and theology, we will use the text, *Food & Faith: A Theology of Eating*, by Norman Wirzba.

The *Science and Theology of Food* course will first be taught in Fall 2017. With the exception of possible guest lecturers, Fr. Buonopane is the sole instructor of the course. The course, based on pre-registration records, is quite popular with students. We were initially expecting 25-30 total students. However, 42 have pre-registered and we have had to cap it at that level due to classroom space constraints. Seven of the 42 students are college seminarians. The hope is that class time will be a healthy blend of lecture and discussion. Class participation will factor into the final course grade. The course will include a generous amount of reading outside of class, including from the two required texts as well as from handouts from other books and journal articles. Students will be strongly encouraged to complete the assigned readings for each lecture. With the larger number of pre-registered students than expected, Fr. Buonopane has revised his plans for oral presentations. Initially it was planned to assign individual presentations, but with the larger student count, the decision was made to go with group presentations with four students per group.

A list of course topics and their order of presentation is shown in Table 1.

- Introduction: How Core I and Core II brings us now to Core III
- Food – What is it?; Overview of food from scientific/chemical, theological, cultural, and ethical perspectives
- Catholic intellectual tradition and how we can apply it to a study of food, science, and theology; Why did God create a world in which every living creature must eat?
- Interdisciplinary nature of food science (chemistry, biology, biochemistry, microbiology, physics, engineering); Food composition: overview of composition of foods and food systems
- Science and chemistry/chemical reactions of major food components: water, water activity
- Food composition: science and chemistry/chemical reactions of major food components: lipid (fat), protein and functional properties; Pertinent foods: meat, poultry, fish, milk and dairy products, eggs, fats and oils
- Food composition: science and chemistry/chemical reactions of major/minor food components: carbohydrate, vitamins and minerals; Pertinent foods: grains, cereals, flour, bread, fruits and vegetables, sugars and sugar substitutes
- Food processing methods, food preservation and packaging; Stability of food components under different processing conditions
- Survey of food and color additives; Genetically Modified Foods
- Food safety: chemical and biological
- Nutrition – eating healthy; Food and metabolism, nutrient absorption/malabsorption
- Special diets: vegetarian, lactose intolerance, gluten-free/celiac disease, weight watchers, DASH diet, Paleo Diet
- Thinking theologically about food
- Food in Sacred Scripture; Jesus and food
- Sacrificial Eating; The Holy Sacrifice of the Mass: Holy Eucharist and food
- Food taboos; Fasting and feasting; Food as cultural identity or social contract; Christian perspective vs other faiths
- Feeding the hungry: right to food, food security and distribution; local resources for the hungry; Food sustainability
- Food and culture; Food consumption: What does America eat?
- Eating disorders: anorexia nervosa, bulimia nervosa, binge eating, food addictions
- Catholic intellectual tradition: Ethical issues surrounding the safety of food and color additives and genetically modified foods

Course Objectives and Learning Objectives

With regard to course objectives, by the end of the course students should be able to:

1. Communicate well the relationship between reason (science) and faith (theology), as St. John Paul II described the two: "*two wings* on which the human spirit rises to the contemplation of truth" (*Fides et Ratio*, 1998). Students are encouraged to develop a strong understanding and appreciation of the relationship between science and faith/theology.

2. Demonstrate an understanding of food science, food chemistry and nutritional science, and to apply such knowledge to various food and nutrition topics, including diet and health, food stability and quality, food addictions, and malnutrition and hunger.
3. Formulate a comprehensive framework of food, particularly from a scientific, theological, cultural, and ethical standpoint.
4. Search and critique the peer-reviewed literature on food science and theology.
5. Develop working strategies to improve feeding the poor and hungry, enhance food security and sustainability, and provide better nutritional quality of food.
6. Contextualize critical thinking and theological reflection of food and eating for personal well-being and practical ministry. Develop and identify well-balanced diet(s).

With regard to learning objectives, by the end of the course students will have:

1. Read a selection of primary sources (peer-reviewed journal articles) and secondary sources pertaining to the integration of food and theology.
2. Articulated the scientific, theological, cultural, and ethical dimensions of food in several properly-cited research papers.
3. Set in motion a plan to improve the well-being of themselves and others through well-balanced meals and proper exercise.
4. As part of a group assignment, delivered a clear and well-thought-out oral presentation on a topic that draws on the relationship between food and theology.
5. Articulated and explained on the cumulative final exam a comprehensive and integrative understanding of the various dimensions of food – scientific, theological, cultural, and ethical.
6. Articulated on the final exam and in a reflective paper their understanding of the working and efficiency of a food pantry and how other hospitality ministries and such services fulfill the Church's call to provide food security and feed the poor.

Course Requirements and Student Evaluation

Student performance in the course will be evaluated by a variety of assignments, including:

- several writing assignments of 3-4 pages, one of which will be an annotated bibliography on the relationship of food with one of the following: science, theology/faith, social sciences/humanities, culture, or ethics
- periodic short quizzes (15-20 min.)
- a service project and report of their experience at a local food pantry/kitchen,
- a group oral presentation on a topic of choice primarily relating the scientific and theological (including the Catholic Intellectual Tradition) dimensions of food

- a cumulative take-home final exam
- class participation

Two examples of writing assignments follow:

1. Focusing on the theme of transformation and the relationship between faith and science, what biblical food passage in the New Testament speaks to you the most? Explain how and why. Address the possible transforming effects of the subject food on you/the human person from both a physical and spiritual perspective. Your response should include a discussion of: 1) the science of the food (particularly its nutritional composition and assimilation in the body) and 2) the food's scriptural/theological relevance and its association with the principles of the Catholic intellectual tradition.
2. Norman Wirzba in his *Food & Faith* devotes chapter three to "Eating in Exile." What does he mean by this title, particularly from a theological perspective? In this chapter Wirzba discusses five "environmental indicators" that affect food sustainability and security (pp. 81-89). Select two of these indicators and discuss their influence on present and future sustainability and security of food from both science and theological aspects.

4. Conclusions and Future Directions

The experience of teaching a new course for the first always reveals the strengths and weaknesses of a syllabus and an instructor's vision. We are curious to determine if the order of presentations that have been set out will prove the most effective. It has been decided to first discuss the food and science relationship, followed by a discussion of the relationship between food and theology and this before relating all three together. Student feedback will reveal the success of this order of presentation.

The course is designed with a variety of assignments to evaluate student performance. Student feedback on the various assignments will be requested during and after the course is completed. The course load admittedly is pretty ambitious. Might there be too much material to present? We shall find out.

We will briefly mention some specific points that we would like to address in future offerings of the course. One is the importance and emphasis that food and feasting(!) plays in particular rites of passage across many faith traditions, including weddings, funerals, bar/baz mitzvahs, etc. We would also like to examine more closely the influence of cultural, social, and biological effects on food selection and eating.

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Acknowledgments

The authors wish to thank the Science and Faith in Seminary Formation program sponsored by John Carroll University, and through a grant funded by the John Templeton Foundation, for the opportunity to develop the new course. Gratitude is also extended to Seton Hall's Immaculate Conception Seminary School of Theology, the Catholic Studies Program, and the University Core, for their encouragement to develop the course.