Celebrating the Past 75 Years and Preparing for the Next 75 Years

At the Annual Meeting in New Orleans on June 21–24 2014, the Institute of Food Technologists (IFT) will be celebrating their 75th anniversary. Our journal is a bit older, with Food Research (the precursor to the Journal of Food Science) publishing its first issue in January of 1936. Science has made tremendous progress in the past 75 years. One case in point occurred 60 years ago with the publishing of the double helix structure of DNA by Watson and Crick in the journal Nature. This could be considered the start of research that ultimately produced the Human Genome.

So what have been the seminal events in Food Science over the past 75 years? Food Science is an integral part of the grand challenge of feeding the world. In one form, it takes agricultural crops and livestock and converts them to foods. Goals such as efficient and sustainable processing of raw materials to food, assuring food safety, and producing foods with extended shelf life are directly linked with sub-sections of the Journal of Food Science (for example: Food Chemistry, Food Engineering & Physical Properties, Food Microbiology & Safety, and Toxicology & Chemical Food Safety). Likewise, there is a need for understanding which food components provide health benefits along with those that regulate sensory and quality aspects. We also have those areas covered (Health, Nutrition & Food, and Sensory & Food Quality). Finally, one needs to be looking forward to how our field can advance. Our sections covering reviews (Concise Reviews & Hypotheses in Food Science) and nanotechnology (Nanoscale Food Science, Engineering & Technology) look to the future of Food Science.

A Scientific Editor runs each of the Journal of Food Science sections. It is their responsibility to assign manuscripts to Associate Editors and make the final decision on manuscripts. The Scientific and Associate editors are the primary gatekeepers to publishing a manuscript. As such, they are in a position that allows them a comprehensive vision of past and current trends in their respective areas. From now through June of 2014, the Scientific Editors of each section will be providing their thoughts on how their area has advanced over the past 75 years and the challenges, and opportunities, presented in the next 75. To provide a comprehensive view from all IFT scientific journals, the Scientific Editors of the Journal of Food Science Education and Comprehensive Reviews in Food Science and Food Safety will also be sharing their vision.

Much has been said about the need for various disciplines to come together to address the grand challenge of society. The concept of “transdisciplinary,” rather than “multidisciplinary,” is intended to emphasize that the need is not in separate disciplines working on the same problem, but more to an approach where the concerns and perspectives of individual disciplines are considered by all. This “bipartisan” approach may be the key to creating a more comprehensive understanding of food. When it comes to Food Science and feeding the world, there are many concerns that need to be considered and I look forward to taking in the insights forthcoming from our Scientific Editors.

Sincerely,
E. Allen Foegeding, Ph.D.
Editor in Chief,
IFT Scientific Journals
75 Years of IFT: Journal Reviews and Hypotheses

The Institute of Food Technologists (IFT) was founded in 1939, making 2014 the 75th Anniversary. The precursor to the Journal of Food Science, Food Research, started a bit earlier in 1936. In the build-up to the Annual Meeting and Food Expo in June of 2014, the Scientific Editors of all IFT scientific journals will be taking a look to the past and future to share their thoughts on how the science has progressed and where it is going.

This first editorial is a joint effort with Professor Manfred Kroger, as Scientific Editor of the journal Comprehensive Reviews in Food Science and Food Safety, and me representing the Concise Reviews and Hypotheses in Food Science section of the Journal of Food Science. The first Concise Review appeared in 1994 and was the only one published that year. We are now averaging about 16 a year and hope to increase that number. Comprehensive Reviews in Food Science and Food Safety started in 2002, and by 2012, had risen to be the journal with the highest impact factor (5.053) of the 124 journals in the Food Science & Technology category.

First, let’s hear from Professor Kroger.

Dear Readers, Food Scientist all, I presume! Occasions of commemoration demand reflection; and 75 years of IFT, and a few more for the Journal of Food Science (JFS), triggers more than a mental view of stacks or shelves of magazines holding the printed accounts of research studies. Much more, since JFS represents the veritable mountain of achievements – a growing mountain – that stands for the dreams and thoughts, and the skill and hardwork, of scores and scores of deeply committed individuals. You may be one of them, you know many personally, and you also recognize the names of some outstanding authors. The growing hill of data, insights, and conclusions represents, in my opinion, the most important achievements of mankind. Do we not agree that what we ingest is more important to life and living than shelter, transportation, education, entertainment, or ideologies? The sum of all food endeavors has surely contributed immensely throughout the ages to human progress on Earth, as measured by lifespan, contentedness, as well as pleasure. And the recent “invention” of science and organized research during the past few centuries has truly accelerated our success in these matters.

I was born several years before JFS saw the light of day, and I now treasure my 50-year IFT membership pin. Looking back at the 1960s makes me smile at the relative simplicity of research reported then. Gas chromatography had just come into its own during the late 1950s as a new separation method. Through my mentor Stuart Patton I was introduced to it and to flavor research. We could now identify and measure micro- and nanogram-amounts of specific chemical substances. Pesticide residue investigations thereafter led us into the picogram realm. In subsequent decades, entirely new areas of food research were opened. Now, as an editor for others, I am confronted on a daily basis by dissertations of newcomers and the ever-better distilled wisdom and skill of the great leaders among us. Seeing their work expand the horizon of food science is, I assure you, a great satisfaction.

The food science knowledge base has, indeed, grown over the years (I am tempted to say “mushroomed”) and its active creators/participants have grown in numbers, worldwide. Food research used to be conducted solely in Europe. In the last half century it was mainly the U.S.A. originating and funding food research activities. Looking at authorships of JFS papers today, it seems inevitable that for years to come China will be leading the world in food science research activities. And it is certain that we all share in it. So, I ask my second question. Does that not make food science the best world unifier there is? We all have common needs and common objectives in our quest to keep generating the necessary calories and nutrients for a growing world population. In my humble opinion, producing food, protecting food, and making it edible and also, of course, the research behind it all, MUST be considered the noblest of occupations.

Something else that has happened, and will continue, is the fusion of pharmaceutical and food science experts. Maybe it started when many universities brought together their nutritionists and food scientists. Their research output is now closely watched by pharmaceutical interests, because the packages of calories and nutrients offered to the public is now no longer known to contain some 3 dozen essential chemical substances along with hundreds of others that are useful and appealing, but also to harbor 1000s of other entities that have gained a reputation to be of medical value and are therefore called nutraceuticals.

Whether free radical scavengers or probiotics, these and many other entities, unknown for so long, can now be measured and studied and put to good use, thanks to the analytical chemists and microbiologists among us. Keep your eyes peeled on developments in nanotechnology and on how “bacteria communicate with each other” and you will be forever fascinated and spellbound by where food science may be heading next. MK.

Dear Readers, after reading Manfred’s comprehensive perspective my concise overview can add little, nonetheless, here are some thoughts. I joined IFT as a student in 1974, so 2014 will be my 40th year in the profession. Seventy-five years ago there was no obesity problem, we still did not have a model for DNA (1953 event), and we were just coming around to large chemical entities being polymers rather than non-covalently associated aggregates. The volume of information has increased exponentially over the past 75 years. I recall a speaker talking about how, when in graduate school in the 1940’s, his protein chemistry journal club covered ALL the main journals publishing work on protein chemistry—something inconceivable with today’s litany of publications. My prediction, or shall I say hope, for the future of Food Science research and publications is that the complex nature of food becomes more of a scholarly focus. Sustainable agricultural practices – assuring food safety – having foods with the most ideal mix of nutrients and bioactive compounds (nutraceuticals) – making delicious foods – and doing it all at a reasonable cost to the
consumer are all interlinked. The age-old approach of observing a phenomenon and then drilling down until you have a physical/molecular/organism model that explains the phenomenon will and must continue. However, since food is part of a linked system with some challenging goals, such as being healthy and delicious, a broad approach will also be needed. The future of food is exciting and IFT scientific journals will be there to convey the next level of discoveries and understandings.

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E. Allen Foegeding, Ph.D.
William Neal Reynolds Distinguished Professor, North Carolina State Univ.
Editor in Chief, IFT Scientific Journals
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75 Years of IFT: Food Microbiology in JFS—1936 to Present

In anticipation of IFT’s upcoming 75th anniversary, it was a welcome opportunity to peruse the historical archives and explore research published in the *Journal of Food Science* (JFS) throughout the last 7 decades on topics of interest to food microbiologists. The very first volume of JFS, published in 1936, explored issues such as the microbiological examination of dried foods, and numbers and types of microorganisms in frozen vegetables and fruits. These issues are as relevant today as they were then. I could not help but think, however, about how much the pathogens of concern have changed, largely as a result of production practices and handling, along with globalization. Where we once worried only about often mild to occasionally severe illness, we now unfortunately associate many pathogens with high mortality rates.

In March of 1936, Hall published an article which explored new outbreaks of botulism in the western U.S., and the prevalence of type A botulism in the Rocky Mountain region largely as a result of inadequately sterilized home canned products. We should all take pride in the fact that extensive research over the years by the IFT community has led to the development of processes and technologies which have virtually eliminated threats due to botulism in commercially canned foods.

It was of great interest to read an article by Walton et al. published in 1936 which explored the bactericidal effects of vapors from crushed garlic. The authors explored the therapeutic uses of garlic with the goal of treatment of tuberculosis. The antimicrobial properties of phytochemicals and essential oils are of enormous interest today, and we receive hundreds of papers yearly related to these topics. By the 1940s, research topics published in JFS included the microbiology of spoilage in canned foods, with a focus on heat resistant spores. By 1950, interest in "cold sterilization" appeared in JFS, with publication of pioneering work conducted on super voltage cathode ray irradiation at the food technology labs at MIT. A paper from 1956 looked at the species of clostridia associated with spoilage of Spanish green olives. It was noted that the author was the recipient of the Samuel Cate Prescott Award for this work. It is heartening to know that we celebrate this award today, almost 60 years later, at the IFT Annual Meetings. By 1964, JFS had become comprehensive enough to warrant topical sections, and a microbiology section appeared for the first time in the Sept./Oct. issue. Topics in the first microbiology section included: *Clostridium botulinum* type E in smoked fish; the role of free and bound water in irradiation preservation; and sensitizing microorganisms to radiation by previous ultrasonic treatment.

I very much enjoyed reading Walter Urbain’s 1970s editorial entitled “Where are we?” In this editorial, he appealed to his JFS colleagues that there “were more papers to publish than we can provide journal pages for them.” Does this sound familiar? Areas of research exploration at this time included infection routes of bacteria into chicken eggs. Just last year (2012), the Food Microbiology and Safety section of JFS published a paper which showed that *E. coli* O157:H7 facilitates penetration of *Staphylococcus aureus* into table eggs. What is the old adage, the more things change . . . .?

By the 1980s, publications appeared addressing topics such as the influence of pH on *Clostridium botulinum* control by sodium nitrite and sorbic acid in chicken emulsions, plating methods, and media for *Clostridium perfringens* and *E. coli*; attachment of *Salmonella* to poultry skin and sterilization of Indian spices by gamma irradiation. It was disappointing to find that research results related to presence of *Listeria* in foods were rarely the subject of JFS articles in the 1980’s. I think we can all acknowledge that changes made to the journal by Daryl Lund and now Allen Foegeding have focused on making JFS one of the preeminent food science journals and we have no trouble attracting the top authors working on the most relevant issues to our food industry.

Here in 2013, the impact factor of JFS has never been higher. The tools we use to generate scientific results have greatly changed, and the tools of molecular biology are already transforming the way we understand the microbiological science of foods. Over the past few years, we have seen a movement away from culture based analysis of microbes to sequence-based analysis, and this trend will likely continue. Genome sequencing will greatly advance our knowledge of the microbial diversity of foods. As high throughput sequencing technologies reveal new information about food ecosystems, we should be prepared for the inevitable regulatory questions which these new findings will raise. As a food microbiologist, I can honestly say that there has never been a better time to be involved in science. I was cognizant, however, upon a recent visit to Louis Pasteur’s home laboratory in Arbois, France, that he probably said these exact works during his time in science. He no doubt paved the brave way forward for all of us associated with JFS and our passion for food microbiology. We look forward to the next 75 years of scientific publication in the company of outstanding IFT professionals.

-Catherine Donnelly, PhD
Scientific Editor, Food Microbiology and Safety
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Sensory Evaluation in the *Journal of Food Science* – 1936 to the Present

It always is interesting to read the early literature of *JFS* and find many articles describing some aspect of sensory evaluation; either as the main focus, as supporting research on the chemical changes of a food under varying storage conditions, or the effects of a new processing method on consumer preference. To gain an appreciation for the role that sensory evaluation has played in the food and beverage industry is to read the 1st volume of *Food Research*, p. 287–95, where there is a manuscript by Sylvia Cover, entitled, “*A new subjective method of testing tenderness in meat—the paired eating method*.” This method is still used in sensory testing, currently referred to as the paired comparison. Throughout its life as *Food Research* and then as the *Journal of Food Science*, one could always find publications in which sensory evaluation was a major part of the research findings. It is also interesting to note that in this time period, *Food Technology* also published peer-reviewed research involving sensory evaluation. Authors, including this author (Stone and others 1974), used the latter publication as a means of disseminating research results to a wider audience, compared to *JFS* which had a smaller readership and took considerably longer to appear in print. As *JFS* switched from quarterly to bi-monthly, it became the journal of choice. In the 40’s and 50’s, research of fundamental importance to sensory evaluation appeared in the Journal; for example, Professors Ed Roessler, George Baker, and Maynard Amerine published a series of articles on statistical tables for difference tests, decision errors in testing and related topics. In the mid- 1950s and into the ’60s, the Journal published research on subject selection (F. Miles Sawyer 1962), Texture Profile Analysis (Alina Szczesniak, Elaine Skinner and others 1962, 1963) and soldiers’ preferences (Frank Pilgrim, David Peryam and others 1955). In this time period Rose Marie Pangborn published the results of her research on flavor interrelationships in model systems in beverages demonstrating the importance of sensory information to product success in the marketplace. Other investigators, stimulated by this research, used *JFS* as a place to publish their research, enhancing the Journal’s reputation in the field.

In the late ’60s as the Sensory Evaluation division began its formation; it petitioned the publishers to make greater use of sensory scientists as reviewers to improve the quality of the research appearing in the journal. IFT accepted our proposal and it was a great step forward for those of us functioning as sensory scientists. In this same time period, more Universities offered course work in sensory evaluation and there was greater recognition of its role in the food and beverage industries. Ultimately this led to the current environment where sensory scientists have a designated place in a journal devoted to reporting research results about sensory evaluation and its applications. There also is a hard working staff of Associate Editors and several hundred scientists serving as reviewers. Continuing through the ’60s through ’90s, the number of submissions and number of articles with a sensory focus has grown significantly. In the first 2 decades of the 21st century, the use of sensory evaluation has continued to grow along with the publication of new methods (Flash Descriptive Analysis) along with more fundamental research on the use of electronic detection systems to minimize reliance on human behavior.

In this more recent “era” the Journal has had the advantage of having 3 Executive Editors, beginning with Owen Fennema followed by Daryl Lund and our current Editor in Chief, Allen Foegeding. Each has made singular contributions, moving the Journal from a 3-year backlog (yes, 3 years from submission through review, acceptance and publication!!) into the electronic age with a 3-month time line from submission to publication. As with other sections of the Journal, Sensory and Food Quality receives manuscripts from all over the world, accepting less than 30% of submissions, in an effort to build high standards and enhance the reputation of the Journal. Over the next 75 years, authors and readers can expect to experience an even faster pace to the publishing process, greater recognition of the value of the information and continued enhancement of the reputation of the Sensory and Food Quality section and the Journal itself.

-Herbert Stone
Scientific Editor, *JFS: Sensory and Food Quality*
75 Years of IFT: Food Engineering and Physical Properties, and Nanoscale Food Science, Engineering and Technology in JFS – 1936 to Present

As IFT gears up to celebrate its 75th anniversary at the 2014 annual meeting in New Orleans, this is a unique opportunity to reflect on the technological advances of the past 75 years and explore the food engineering research published in the Journal of Food Science (JFS). During the early 1900s, the technological development of canning by Prescott and Underwood at the MIT paved the way for food engineering research. In the early 20th century, research on thermal processing began its upswing, and was published mostly in National Canners Association (NCA) bulletins. In 1936, the birth of Food Research (predecessor of JFS) provided a platform for food technologists to publish their research findings.

The first issue of JFS, published in 1936, featured an article on pasteurization of Concord grape juice by Carl Pederson of the New York State Agricultural Experiment Station. This study demonstrated that grape juice can be pasteurized successfully at temperatures below 74 °C, which was considerably lower than the temperatures of 88 to 100 °C that were used in the industry and in the home at that time. Pederson obtained the transient temperatures of the juice using a long-stemmed mercury thermometer inserted through a cork at the center of the bottle, and determined the time needed to achieve the desired temperatures. This method of heat penetration has been fundamental to thermal process calculation. Since then, instruments for gathering time-temperature data during processing have become more sophisticated. In subsequent issues of JFS, Tressler and Pederson demonstrated the role of headspace oxygen on the storage quality of pasteurized juice. They showed that juice pasteurized at 73.4 °C for 30 min, when stored with little or no oxygen at 1.1, 8.3, and 22.2 °C, retained excellent flavor and aroma for 3 mo. Another paper in this 1st issue of JFS also highlighted the vacuum desiccator and water displacement methods to determine the vacuum in glass jars. The development of vacuum in food containers sealed hermetically is central to thermal sterilization.

In his seminal paper in the January 1938 issue, Colin O. Ball presented a comprehensive review of advances made in sterilization methods for canned foods. Ball has been recognized for Formula methods, which he developed in 1923 for thermal process calculation. Formula methods were extensively used by the canning industry worldwide for several decades after they were introduced. These process calculation methods are still taught to undergraduates in Thermal Processing courses. Ball’s review described food preservation methods used in terms of 2 time periods: before and after Appert developed the canning process. The article described the term ‘commercial sterilization,’ which referred to the term ‘sterilize’ as applied to canned foods. The review covered the development and improvement of thermal processing equipment and the use of the thermocouple in heat penetration studies. The review also explored the relation between processing temperature, heat penetration, and product quality. Ball also emphasized the importance of a faster rate of heat transfer, which prompted the introduction of continuous and agitated retorts. In addition, he advocated high-short sterilization, later referred to as the high-temperature short-time (HTST) process, to improve quality of convection-heated foods. Finally, this seminal article presented a comprehensive review of patents on high-short sterilization and food preservation by other means than heat.

In a fascinating article published in the March 1938 issue, Burton (editor of Food Industries, a McGraw-Hill publication) emphasized the need for trained Food Engineers and the development of the Food Engineering discipline, a branch of engineering related to the industrial production of food and food products. Burton linked Food Engineering to Chemical Engineering, and highlighted the importance of unit operation to the field. At the first Food Technology conference in the U.S., Samuel Cate Prescott, the 1st president of the Institute of Food Technologists (IFT) and founder of Food Research (JFS since 1961), gave the welcome address. In his article in the March 1938 issue, Prescott noted that early work in food chemistry and later, the bacteriology aspects of food preservation led to Food Engineering research and teaching efforts at MIT.

Since then, tremendous progress has been made in the science and technology of thermal processing. This is very well-reflected in the JFS articles published over the last 70 years. These articles present detailed quantitative analyses of heat transfer during thermal processing of solid, liquid, and liquid solid mixtures; thermal process design and optimizations; and the development of sterilization systems and packaging for thermally-processed foods. For example, a 1974 paper by Simpson and Williams presented a rigorous mathematical analysis of high-temperature short-time sterilization in a continuous flow system. Many JFS articles have employed physics-based mechanistic modeling to provide insight into food processes. A recent November 2013 paper presented a comprehensive mathematical model for heating a multicomponent solid-liquid mixture with a continuous Ohmic heater. The mathematical model was validated with experimentally obtained temperatures and microbiological tests. Another article in the same issue applied computational fluid dynamic analysis to simulated fluid flow and heat transfer during thermal processing of olives in brine in a stationary tin can. These studies are particularly relevant to thermal process design and optimization that lead to the production of safe, high-quality products.
By the 1940s, research topics published in JFS included food freezing, food drying, modified atmosphere storage, and various aspects of thermal processing. In the 1950s, scientists at MIT and the National Canners Association laboratories began investigating ionizing radiation to produce preserved foods with natural quality. Early papers on this technology dealt with the irradiation destruction kinetics of spores and spoilage bacteria using X-rays, gamma rays, and cathode rays. In 1957, JFS published a quantitative study of combined heat and radiation treatment by MIT scientists. During the 1950s, scientists learned about the relationship between vapor pressure of water in food and microbial spoilage in foods. A 1955 JFS paper by Mossel and Kuijik related limiting equilibrium relative humidity values to the growth of broad classes of microorganisms in foods. They utilized modified lithium chloride cells to estimate the equilibrium relative humidity of foods. In the years following these early papers, JFS regularly featured articles on the continued development of irradiation and water activity. From the 1970s to the present, a significant development occurred in thermal and nonthermal food processing technologies, for example, aseptic processing and packaging, baking, extrusion, electrothermal technologies, frying, membrane filtration, high hydrostatic pressure, ultraviolet light, oscillating magnetic fields, and ultrasound. Research on these technologies included equipment development, mathematical modeling of transport processes, and kinetics of microbial and quality changes. JFS frequently published articles on many of these food processing technologies.

Thermal destruction kinetic parameters made up an integral part of thermal process design. In the 1950's, JFS covered topics on kinetic studies of microorganisms, food enzymes, and quality attributes. In 1998, the FDA assigned a contract to IFT to provide scientific and technical review and analysis of emerging and alternative technologies with the potential to enhance food safety and quality. In consultation with academic experts and considering the requirements of other governmental agencies, IFT prepared a report that was published in the November 2000 JFS supplemental issue. This issue featured several papers highlighting the background, scope of study, executive summary, overview of fundamentals of several food technologies, kinetic parameters and models used in food preservation processes to ensure safety, and future research directions.

With continuing progress in the mechanistic understanding of food processes, the need for food properties data became evident. At the same time, the rheological properties of solid and liquid foods were correlated to consumer acceptance. As early as 1937, Evelyn Halliday's editorial review outlined objective tests for measuring food properties. In 1938, Volodkevich of the Univ. of Karlsruhe published an article on the measurement of the chewing resistance of foods. Volodkevich developed an apparatus to record force as a function of deformation in order to determine the energy required for this deformation. Interestingly, this study used rounded wedges and artificial teeth to compress food samples.

In later years, the JFS section of Food Engineering and Physical Properties regularly featured papers on the rheological properties of liquid, gel, and solid foods, the transport and thermodynamic properties of food, and phase/state transitions in foods. By the 1980s and ’90s, JFS published studies using advanced techniques of nuclear magnetic resonance, magnetic resonance imaging, and X-ray microtomography to probe into food properties. These techniques investigated the interactions between water and food solids, food microstructures, temperature mapping, and mass transfer in foods. A recent paper published in September 2013 included image analysis to quantify the particle breakdown in foods as well as the role of food properties in food breakdown during gastric digestion.

Starting with the January 2008 issue of JFS, under the leadership of then Editor-in-Chief Daryl Lund, 3 new sections were added to provide greater visibility of cutting-edge food science research. For example, a section was added on Nanoscale Food Science, Engineering, and Technology (NFSET), with M. Anandha (Andy) Rao as Scientific Editor. This section featured original research on science and the application of nanoscale materials and relevant phenomena. The first paper published in this section appeared in the March 2008 issue, and focused on a production method for nanostructure lipid carriers in food beverage applications. This paper also examined the physical properties and stability of lipid carriers at different temperatures. Since then, this section has regularly featured articles on new methods of producing biocompatible nanoparticles and nanocomposite polymer films with improved functional, physical, and gas barrier properties. An October 2011 paper examined the potential for development of polypropylene and nanoclay composite films with improved thermal, mechanical and gas barrier properties in food applications. Finally, a recent paper in the December 2013 issue investigates the synthesis and characterization of nanoencapsulated particles for antioxidant and antimicrobial applications.

Looking into the future

Many recent developments in food science and engineering provide a glimpse into future research directions. During past decades, significant research on advanced thermal and nonthermal food technologies has brought these technologies closer to commercialization. In 2009 and 2010, the FDA approved 3 petitions to preserve low-acid foods using pressure-assisted thermal sterilization and microwave-assisted thermal sterilization systems. Approvals of these petitions were made on a case-by-case basis. The research necessary to commercialize these and other thermal and nonthermal food processing technologies will continue in coming decades. Industrial adaptation of novel food technologies will present new challenges and opportunities related to the development of energy- and water-efficient equipment, automation, and high-performance packaging with reduced environmental impacts. Therefore, future research may take this direction. In the recent past, there have been several foodborne illness outbreaks linked to fresh produce and low-moisture foods. Food engineers will continue making advances in decontamination technologies to enhance microbiological safety of fresh produce and low-moisture foods.

In addition, further research on physics-based mathematical modeling may lead to user-friendly computer simulation tools that allow engineers to significantly speed-up the development of new processes and products analogous to the automobile and aerospace industry. New developments in imaging techniques (such as computed microtomography, magnetic resonance imaging, atomic force microscopy), spectroscopy (for example, Raman, X-ray photoelectron, scanning tunneling, nuclear magnetic resonance, positron annihilation lifetime), and micro and nanoscale structure characterization techniques (small-angle and wide-angle X-ray scattering) will allow us to analyze properties of food, biopolymers and packaging materials at the atomic and molecular levels. In conjunction with bulk properties, molecular and atomic-level food properties may provide a new understanding of transport behavior in heterogeneous and complex food structures during processing and storage. This data on physical properties is also
vital to the improvement of food processing technologies. Research will continue to explore the flow and digestion of food after ingestion. Investigation in nanotechnology may provide new ways of designing nanostructures for nutrient delivery and antimicrobial properties of food contact surfaces. Scientific and technological development in processing and packaging technologies may allow the food industry to produce "designer food" according to the desired sensory characteristics and physiological needs of individuals. As we look forward to these and other exciting developments, JFS is poised to provide an excellent platform for dissemination of the science and engineering of food over the next 75 years and beyond.

Sincerely,
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Food Engineering and Physical Properties; and Nanoscale Food Science, Engineering, and Technology
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75 Years of IFT: Health, Nutrition, and Food in JFS

The Journal of Food Science (JFS) has been disseminating and sharing scientific knowledge via publication of excellent research for 78 years, since its first printing in 1936. As we think about these 78 years, we can look back to when it was one of only 2 or 3 journals devoted to the field of food science. But even as the number of publications increased, JFS held the place of the premier publication in the field of food science. We are proud of our history, receiving a huge number of manuscripts from all over the world and publishing the most current and scientifically viable of them throughout all these years.

In 2000 I was honored to be invited by Professor O. Fennema, then Editor in Chief of the Journal of Food Science, to serve as Scientific Editor for the “Sensory and Nutritive Qualities of Food” (SNQ) section of the Journal. In 2008, because of the increased interest in nutraceuticals and functional foods, the SNQ section was divided into 2 sections, the “Health, Nutrition and Food” (HNF) and the “Sensory and Food Quality” (SFW) sections, and I became Scientific Editor for both. Subsequently, I made the decision to serve as Scientific Editor for only “Health, Nutrition and Food” (HNF) due to my keen interest and devotion to this area.

Although the Health, Nutrition, and Food section of the JFS only began in 2008, we can trace the history of the subject to the very first article in the very first issue of the journal: “Vitamin C. Content of Vegetables. I. Spinach” by Tressler, Mack, and King (Food Research 1(4):1-7, 1936). Since that beginning, the scope of food science has expanded. A good example of this diversified research is a recent article by Bornhorst, Roman, Ruthruff, Burri, Moughan, and Singh, “Gastric Digestion of Raw and Roasted Almonds in vivo” (J Food Sci 78(11):H1807–13, 2013).

It’s nice to look back on where we’ve been and what we’ve done, but it’s even better to look forward to what can be accomplished in the future and some of the ways we hope to improve the health and well being of all people. Obviously, the mission of HNF is to provide basic research data (such as molecular mechanisms) and practical research (that is, process and product applications) to advance this goal for a healthy population.

As the name and scope of the section implies, HNF is uniquely suited to trans-disciplinary work. HNF is devoted to “original research that integrates food science and technology with applied personal and public health nutrition.” We believe that cooperation (both trans- and multi-disciplinary) between scientists in varied, yet connected, fields will move us forward in an advantageous way, and the HNF section of the JFS will be proud to continue to publish the work of these talented and capable researchers. The recent publication cited above is an excellent example of trans-disciplinary research with applications to nutrition, health, and food. The HNF designation is directly related to the developing areas of functional foods and nutraceuticals. Modern nutrition and food science focuses on health promotion, disease risk reduction and improved performance through diet.

Since inception in 2008, HNF averages more than 1 submission a day; however, unfortunately, not all are suitable for publication. Authors should be cautioned that manuscripts that are about non-food-based materials (that is, derivatives from chemical, biochemical, and/or other process) or that lack sufficient qualitative and quantitative data on chemical identification, characterization, and standardization relating to all individual bioactive components involved are rejected, as clearly stated in the scope of the HNF section.

I’d like to address some recent activity of the European Food Safety Authority (EFSA) and a recent publication (“Defining the Public Health Threat of Dietary Supplement Fraud,” Wheatley and Spink, Comp Rev Food Sci Food Saf 12(6):599–613, 2013) that deal with a subject relating to HNF. In February of 2010, the EFSA published a series of opinions on a list of “general function” health claims. They collected data to substantiate these (416) health claims and sent them to the European Commission and to Member States who will decide whether or not to authorize these claims. There are 3 main criteria that must be met for claims to be endorsed by these authorities. First, a claim must identify the substance on which it is based, for example, probiotics; 2nd, it must prove that it is beneficial to the maintenance or improvement of body function, for example, foods with antioxidants; and 3rd, there must be a human study with reliable measure of the claim with regard to a health benefit. In a similar vein, Wheatley and Spink provide a comprehensive overview on the public health threat of DSF to focus on altering current intervention and response-based approaches that are prevention based. This research establishes a starting point for defining dietary supplement fraud and identifying their public health risks, both of which are important concerns for HNF. It’s a subject that we hope to see addressed, scientifically and morally, in detail and comprehensibly, without regard to commercial interests, by researchers in the near future.

Based on my experience in the past and my expectation for the future, in order to make real contributions and have manuscripts published in the HNF section of JFS that have a positive impact I believe I should select foci for future publications; therefore, at this time I would like to encourage the submission of manuscripts to the HNF section of the journal that include, but are certainly not limited to, the following 4 foci.

(1) Manuscpts based on nutrigenomics

Nutrigenomics includes the full spectrum of research strategies from basic cellular and molecular biology to clinical trials, epidemiology and population health. Research in this area will lead to an understanding of how nutrition affects various health outcomes and the role of genetic variation to understand why some individuals respond differently from others to the same nutrients consumed. A clear understanding of how the gene, the physical unit of diet, interacts with nutrients has the potential to support disease prevention through optimization of dietary recommendations.
(2) Manuscripts based on development of foods for people over 65

The elderly are an overlooked portion of the population. As the Baby Boomers age and remain the largest demographic specific attention should to be paid to them. As it ages the body changes so its needs also change. Older adults change in their physical abilities as well as their nutritional needs. Needs vary by individuals as well as by general population. As of now, there are very few products aimed directly at age 65 and older. With research and development there is a huge market waiting. The trans-disciplinary nature of the HNF section lends itself particularly well to this need. The research areas of gerontology, nutrition, food science, medicine, and social services can combine to result in health benefit information for the elderly.

(3) Manuscripts based on food allergies and food intolerances

As food allergies and food intolerance are increasingly being looked at as important safety issues, food manufacturers, legislators, and researchers need to focus on how a variety of foods can be adapted to the different nutritional, as well as taste needs, of individuals with particular allergies and food intolerances.

(4) Manuscripts based on the epidemic of overnutrition (obesity)

Added to the continuing problem of malnutrition is a new challenge – overnutrition. "It is estimated that by 2020, two-thirds of the global burden of disease will be attributable to the 'overnutrition challenge.' Chronic, noncommunicable diseases, most of them strongly associated with diet, will be prevalent. The nutrition transition towards refined foods, foods of animal origin, and increased fats plays a major role in the current global epidemics of obesity, diabetes, and cardiovascular diseases, among other non-communicable conditions." (Bull World Health Organization – http://dx.doi.org/10.1590/S0042-96862002001200009)

As we look forward to the next 75 years of the Journal of Food Science, it is my belief, both professionally and personally, that as food is a global necessity, its safety and benefit is of paramount importance, and so Food Science is of universal interest and has a unique opportunity to serve the welfare of mankind. We have no doubt that JFS will play a major role in such endeavors.
Toxicology and Chemical Food Safety in the Journal of Food Science: 1936 – the present

One only needs to read the front page of a newspaper or listen to reports either on radio or television to be reminded of the frequency by which chemical foods safety topics are covered by the popular press. Over the past 5 to 10 years, topics that made “front-page” news include the discovery of arsenic in rice and rice products, intentional contamination of pet food and milk products with melamine, migration of packaging constituents and contaminants into food, detection of acrylamide and other heat-produced toxicants in food, an increase in the prevalence of food allergies, and discovery of residues of banned pesticides in crops. Despite the belief by many that chemical food safety problems are new phenomena associated with industrialization and the globalization of the food supply, they actually have been newsmakers for well over 100 years. On review of the papers published in JFS since its inaugural issue in 1936, it becomes apparent of the journal’s leading role in disseminating information on key chemical food safety and toxicological issues of the day; virtually every issue of JFS contains at least 1 review or research paper on detection, characterization, and mitigation of chemical hazards in food. This short review gives a historical perspective on key toxicology and chemical food safety topics that have been published in JFS from 1936 until now.

On examination of the papers published in JFS during the 1930s and 1940s, one will discover that the majority of those pertaining to chemical hazards and toxicology are either reviews or research studies on heavy metal contamination of food. One of the first chemical hazard papers published in JFS (1936, volume 1, issue 6, pp. 529–36) describes a research study on the transfer of antimony from cookware into foods, and the possible role of antimony in cases of food poisoning. The authors, Emanuel Kaplan and Ferdinand Koff (Baltimore City Health Dept.) found that antimony present as a contaminant in some enameled cookware could be extracted into acidic foods during storage and cooking. Based on the results of the study, the authors recommended that use of such cookware be avoided to reduce exposure to the metal and possible food poisoning. Another paper, published by Harrison in 1938 (volume 3, issue 1–2, pp 121–25), reviews the uses of spectroscopy in food research, with a main emphasis on detection of contaminants such as arsenic, lead, copper, and other heavy metals used in pesticide formulations. Similarly, a 1942 review written by FDA scientist, Herbert O. Calvery (volume 7, issue 4, pp 313–31), summarizes the state of knowledge on trace elements in food and their toxicological properties. Lead contamination of honey and maple syrup were other areas addressed in JFS papers published during this time period as well as chronic toxicological assessments of diphenylene sulfide, a pesticide, and propylene glycol, a food additive.

Advances in the field of toxicology that occurred during the 1940s and 1950s resulted in more systemic approaches for evaluating the safety of food ingredients and contaminants. Consequently, many of the papers published in JFS in the 1950s pertained to toxicological studies of emulsifiers and stabilizers (stearyl citrates, phenyl phthlate, and polyoxyethylene monoestearate or monolaureate), a fumigant (methyl bromide), and enamel coatings used in metal can linings. All of these studies have provided the supporting data needed to assess the safety of these additives and contaminants in foods. Other notable papers published during the 1950s pertained to the detection of growth enhancers such as diethylstilbestrol (DES) in beef, lamb, and poultry, and a method for detection of adulteration of beef, lamb, and pork with horsemeat based on species differences in linoleic acid content.

Advances were made in the field of analytical chemistry in the 1960s that allowed detection and quantitation of chemical hazards in foods at levels several orders of magnitude lower than were previously possible. Before 1960, methods to detect and quantify constituents and contaminants in food were mainly limited to the use of colorimetric and spectrophotometric assays. Gas chromatography (GC), first developed in the 1950s, became commercially available the 1960s, while high performance liquid chromatography (HPLC) became readily available for the food analysis laboratory in the 1970s. Consequently, during the 1960s and 1970s, there was a proliferation of publications in JFS pertaining to detection of pesticide residues (dieldrin, lindane, DDE, DDT) and the effects of cooking, processing, and storage on levels of these contaminants in crops, dairy products, and animal tissues. During the 1960s several papers were published on the effects of food irradiation on food constituents and a toxicological assessment of irradiated foods.

JFS’s key role in educating food scientists of current chemical food safety problems can be attributed to publication of scientific status summaries written by IFT’s Expert Panel on Food Safety and Nutrition. The first of these summaries, “Nitrites, Nitrates, and Nitrosamines- A dilemma,” was published in 1972. At the time the report was written, considerable concerns were voiced by consumers over the addition of nitrite to cured meat, and the formation of nitrosamines, known human carcinogens, in cured meats during cooking. The report gave a concise summary of the history of use of nitrite in food, regulatory limits for use of nitrite, and toxicological studies on nitrates, nitrites, and nitrosamines. Other excellent status reports were published by IFT on safety of carrageenan (1973), mercury in food (1973), and naturally-occurring toxicants found in foods (1975). In 1973, USDA scientists (Fiddler and others) published a research paper in JFS demonstrating that addition of sodium ascorbate or erythorbate to cured meats reduces formation of nitrosamines during cooking. Several other notable papers published in the 1970s were by Gilbert and colleagues (Rutgers Univ.) on the development of experimental techniques for estimating migration of packaging constituents and additives into foods. Numerous papers were found in JFS during this time period on the detection, distribution, and stability of plant toxins, mycotoxins, agricultural chemicals, and industrial chemicals in food.
During the 1980s and 1990s, advances were made in identifying conditions that lead to formation or contamination of food with chemical contaminants, which resulted in approaches for control of these hazards. Methods for detection of food chemicals improved due to the development of antibody-based or immunochemical methods, and the commercialization of the mass spectrometer which became an affordable addition to the majority of food analysis and research labs. In the mid-1980s, food allergies became recognized as a significant public health issue, and papers on the allergenicity and chemical properties of allergens in milk and egg began to appear in *JFS*. In 1984 (volume 49, issue 2, pp. 529–30), Shuichi Kaminogawa and others published one of the first papers in *JFS* that focused on food allergens. This paper describes a study of protein fractions isolated from reagent- and food-grade lactose and their skin reactivity in milk–allergic patients. Other groundbreaking articles on food allergens compared the antigenicity of native and processed (thermally and hydrolyzed) milk, soy, and egg proteins. Research topics that drew a large number of submissions to *JFS* in the 1980s and 1990s were on the detection of toxic fungi (*Aspergillus*, *Penicillium*, and *Fusarium* spp) and the stability and control of the mycotoxins (aflatoxins, patulin, trichothecenes, ochratoxins, and fumonisins) they produce. Similarly, numerous papers also described studies on the formation of biogenic amines such as histamine and tyramine in fish, meat, and cheeses.

After the events of September 11, 2001, there were increased concerns that the food supply could be compromised through deliberate contamination with chemical agents such as heavy metals, natural toxins, and agricultural chemicals. As a result, a number of articles appeared in *JFS* from 2003 until recently on rapid methods for detection of chemical threat agents and chemical adulterants and their stability in foods during food processing and storage. Similarly, more attention has been given to development of analytical methods for detection of adulterants in foods and ingredients based on the discovery of melamine in wheat gluten, protein ingredients, and milk products imported from China. One of the most highly cited papers published in *JFS* in 2008 describes the development of a method for detecting melamine in protein–based ingredients, processed foods, and animal feed using Surface Enhanced Raman Spectroscopy (SERS) and HPLC (Lin and others, volume 73, issue 8, pp. T129–34). Numerous papers have been submitted to *JFS* since 2008 on the use of infrared and Raman spectroscopy to authenticate food ingredients and for detection of chemical adulterants. In 2012, a noteworthy review paper was published in *JFS* by Moore, Spink, and Lipp (volume 77, issue 4, pp. R118–26) on the development and application of a database of foods and ingredients most vulnerable to adulteration, and analytical methods that are currently available to detect adulterated foods and ingredients. Other important and well-represented topics published in *JFS* since 2003 pertained to the formation and mitigation of acrylamide in foods, toxicological assessments of botanicals and novel ingredients, dietary exposure assessments to heavy metals, and development of improved assays for detection of allergens in food.

As the *JFS* moves into its next 75 years of publication, some predictions can be made about topics that will be covered by the journal. Due to the global nature of the food supply and advances in analytical science, chemical food safety will continue to be an area of concern, and a major area of focus for papers published in *JFS*. First, the discovery of new botanical and bioactive ingredients will require an evaluation of their safety. Second, as importation of foods and ingredients increase, there will likely be more instances of adulteration, resulting in the need for rapid methods for adulterant detection. Finally, as analytical methods become more advanced, there will likely be discovery of new mycotoxins and food processing contaminants, which will require the need to understand conditions for formation and ways for preventing their occurrence in food. As we move into the future, we at *JFS* look forward to continuing the tradition of excellence in publication of ground-breaking papers in food science and technology. We sincerely hope that you consider *JFS* for publication of your excellent research in the areas of food toxicology and chemical food safety!

—Lauren S. Jackson, Ph.D.
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Food is an indispensable nutritional substance humans must ingest in order to sustain life. All the nutrients making up a food are chemicals in a broad sense. Therefore, food chemistry – the study of food composition, structure, chemical processes and interactions, and properties – has always been a core component within the large food science discipline. As food science is an interdisciplinary subject, food chemistry by nature is a network connecting multiple disciplines in related fields – botany, zoology, microbiology, and so on. The origin of food chemistry is somewhat uncertain and remains vague to many people outside the food science community. Literature extending into antiquity would describe food chemistry in terms of agricultural chemistry. While it seems difficult to trace the origin of food chemistry, it is relatively easy to reflect on the evolution of food chemistry in the context of relevance in recent history.

The Journal of Food Science (JFS), incepted in 1936, was established to publish scientific discoveries germane to chemical components, nutrition, processing, and properties of food. The very first article printed in JFS, then Food Research, was about one of the most important chemical compounds present in food that humans and animals alike must consume – vitamin C (Tresler and others. 1936. Vitamin C content of vegetables. J. Spinach. Food Res 1[1]:3–7). Over the years, as the food industry continued to evolve, JFS has undergone notable changes in scope and priority. For example, in the very early years, the emphasis of a typical food chemistry article in JFS was chemical composition and analysis. While such studies remain important, the Food Chemistry section of JFS today is requiring each acceptable article to dive more deeply into science. We expect authors to address the fundamental mechanisms behind an observed chemical change(s) so as to provide a clear understanding of the molecular interactions valuable to food processors. This new expectation is justifiable because we recognize that basic research is essential to the invention of new technologies or the improvement of existing ones to answer challenges encountered during food production, processing, storage, and consumption. Manuscripts that do not address a specific hypothesis or mechanism are no longer accepted. What has not changed, however, is the core value of JFS: each published study must have a clear relevance to the food industry. This particular requirement sets JFS apart from many other journals and makes JFS a mindfully high-impact journal for the food and nutrition industry, regulatory agencies, and society at large.

In the beginning, when JFS was one of very few science-based journals in the field reporting original research specifically linked to food, many articles published in JFS described groundbreaking discoveries – the chemical composition of a traditional or new food, production factors affecting the concentration and stability of an important nutrient, the influence of a novel processing method on the nutrient retention, a new analytical method suitable for food ingredient analysis, and so on. For example, the decade of the 1940s and a major portion of the 1950s saw extensive chemical analysis of vitamins in various foods as related to sources, processing, and storage. In the 1950s and well into the 1960s, with the availability of gas chromatography and mass spectrometry, papers on flavor chemistry began to fill JFS volumes. From the 1970s to the 1980s, meat quality studies produced a wide array of collections of original articles published in JFS to explain postmortem chemical events occurring within the complex muscle system. For example, muscle food chemistry and biochemistry, including lipid and myoglobin oxidation, postmortem meat tenderization and proteolysis, cured meat color, and functionality of proteins in processed muscle foods (red meat, poultry, and fish), were vigorously explored and the findings well covered by JFS. Pioneering researchers in the field, including Herbert Hultin, Robert Cassens, Darell Goll, and Tsutomu Yasui (to name a few), were all active contributors to JFS. An excellent original and well-cited paper exploring the new field of muscle protein chemistry and biology was published by Samejima and co-workers in 1981 (Relative roles of the head and tail portions of the molecule in heat-induced gelation of myosin. J Food Sci 46[5]:1412–18). These studies, along with many others on proteins, lipids, carbohydrates, flavors, pigments, food additives, and vitamins in various animal and plant-derived food commodities had led to the conception and eventual assembly in 1976 of the first edition of the famous Fennema’s Food Chemistry textbook, then titled “Principles of Food Science. Part 1 – Food Chemistry” released by Marcel Dekker. Contributing authors to this groundbreaking volume – the first ever of its kind – were world renowned food chemists who also published extensively in JFS. For those who attended the Owen Fennema Memorial Symposium at the 2013 IFT annual meeting, I think the rest is history. It goes without saying that JFS, as a premier scientific journal, provided a solid foundation and critical information database for this and many other influential seminal volumes published in the field in the years that followed.

As the health benefits of many food components became increasingly recognized and the market demand for nutritionally-balanced diets continued, the concentration of food chemistry research within JFS in the 1990s gradually migrated to the understanding of chemical structure-biological function relationships. Plant proteins, dairy protein, peptides, phenolic compounds, complex carbohydrates, and antioxidants became very popular subjects of research endeavors. As the trend continued into the 2000s, lines that used to divide food chemistry and nutrition, health, toxicology, processing, and other specific aspects of food science began to blur due to the integrated nature of new scientific approaches. There was a rapid growth spurt of “-omic” studies during this period. The availability of highly sensitive, versatile, and sophisticated analytical instruments combined with powerful computational technologies has allowed food chemists to decipher the complex food system to examine molecular interactions of food quality and nutrition relevance at the nanomolar or even picomolar concentration levels. For example, Boatright’s (2013)
“Hydrogen peroxide generation from hydrated protein drink mixes” (J Food Sci 78[11]:C1651–8) applied chemiluminescence and electron paramagnetic resonance spectroscopy to test and prove the hypothesis that H$_2$O$_2$ and daughter radicals can be generated through metal-ascorbate redox cycling in soy and whey protein beverages upon hydration.

A typical study published in the Food Chemistry section of JFS today is no longer confined to chemical reactions. Instead, imaging analysis supported by algorithm is often introduced to elucidate the consequential impact of a chemical process under exploration. Likewise, rheological measurements are often introduced to complement chemical analysis and assist data interpretation. A study that was just published by Xiao and others (2014), “Discrimination of cherry wines based on their sensory properties and aromatic fingerprinting using HS-SPME-GC-MS and multivariate analysis” (J Food Sci 79[3]:C284–94) is a good example of modern chemical research taking a holistic approach. Interactions between multiple food constituents and additives, previously unable to be determined, can now be elucidated. For instance, UPLC-MS applied to separate, detect, and quantify individual polyphenols, peptides, fatty acid derivatives, and flavor compounds and their interactions in a complex food system, such as a food emulsion, is often complemented by structural and morphological analysis with tools ranging from atomic force microscopy and confocal laser scanning microscopy to cryo-transmission electron microscopy in order to highlight chemical changes and their impact on food quality and nutrition.

Another notable change in JFS publications in recent years is the demographic diversification of contributing authors. In the 1980s, JFS began to receive more submissions from international authors. By the end of last century, studies completed in food chemistry laboratories outside the United States quickly comprised a significant share of the papers published in JFS. Because many of the studies carried out overseas are globally relevant and involve collaborators from multiple countries and regions, they contribute greatly to both the scope and depth of JFS. In 2013, the Food Chemistry section alone received 663 manuscripts, about one-third of the total submissions received by JFS. China led the way in the number of submissions followed by the United States, South Korea, India, and Spain. A new era has arrived! This is indeed exciting because countries with vast human populations, hence, a high demand for fresh and processed foods, are becoming important members in the global scientific community thanks to the rapid development in research infrastructure, advanced training, and willingness of governments and private industries in those emerging countries to make the financial commitment.

If food chemistry research in its first 75 years was about discoveries, the next 75 years are bound to the quest for innovative technologies utilizing the knowledge acquired from discovery research to create composite food systems with high palatability, nutritive value, ensured safety, and convenience. For example, a computer-assisted in silico approach may be taken to effectively identify bioactive compounds produced from chemical reactions and biochemical processes. The cross-disciplinary nature of food chemistry necessitates greater efforts from all researchers to take a holistic approach in the study of food by integrating physical, mechanical, biological, and medicinal methods into the chemical analysis.

As one of the most influential international journals that has served the food industry and the scientific community for more than 75 years, JFS continues to strive for dissemination of high-quality papers that are truly of societal impact. On behalf of the editorial board of the Food Chemistry section, I thank all past and present contributors to our section and welcome manuscripts from new authors. Prospective authors are reminded to read the following aim and scope when deciding whether your papers will be a proper fit in JFS: “Basic and applied research on food constituents to understand their role in determining food quality, safety, nutrition, and health. The constituents may include those that are naturally present (e.g. macro- and micronutrients, fibers, and phytochemicals) or added (e.g. additives, preservatives, and functional ingredients) to the food. Manuscripts lacking focused research to address a specific hypothesis or mechanism; establish or improve an analytical method; or improve the current understanding of food chemistry, will be outside the scope”.

Finally, I want to thank you all for your support. As always, we welcome you to submit manuscripts that you are proud of and I assure you that each submission will be given due consideration. I hope to see many of you at the IFT annual meeting next month in New Orleans where world renowned Cajun and Creole savory cuisines are served. What a place to meet and discuss food chemistry!

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Seventy-Five Years of IFT: The Journal of Food Science Education

In April 2002, the Journal of Food Science Education made its Web-based journal debut, joining the Institute of Food Technologists’ flagship Journal of Food Science. As stated by the then Editor-in-Chief, Dr. Owen Fennema, “When I accepted the position of Editor-in-Chief of IFT Scientific Journals a few years ago, one of my primary goals was to create an array of scientific publications consistent with the international importance of the Institute of Food Technologists. At the time of my appointment, IFT had only one scientific journal, the Journal of Food Science, which accommodated manuscripts on original research and short reviews. IFT had no means to communicate information in the form of long reviews and monographs, or any mechanism to communicate subject matter in the area of food science education—very serious shortcomings in my view. Now, after careful deliberation by pertinent IFT management bodies, the means to accommodate all of these publication modes have been wisely sanctioned and are making their first appearance, or will very soon.” I am very proud to be a part of this first volume of the Journal of Food Science Education (JFSE).

Since the inaugural issue of JFSE, numerous authors have shared their contributions to food science education using a variety of venues, including the scholarship of teaching and learning research articles, classroom techniques, innovative laboratory exercises, teaching tips, guest editorials, and book reviews. The contributions have taken many forms; however, they all center on one common and specific objective—to advance the teaching and learning of food science at all educational levels.

It is an especially exciting and pivotal time to be involved in education. Advances in brain science research have provided windows into how the brain works and, moreover, how the brain learns. These findings are being directly translated into effective classroom and curricular practices to help students learn more effectively, efficiently, and joyfully (Willis 2006). As we look to the future, we can imagine the development of new methods and means of educating students based on brain science research coupled with the use of modern technology advances, including social media. But, even with all these new developments and advances in brain science and technology in general, we cannot forget the underlying mechanism of freezer burn and instructions for freezer burn experiments and demonstrations. What food science content knowledge can you share in the JFSE? Contributions from industrial experts would be grand! Other topics that would make a great contribution to the JFSE are: “Tips for a successful internship,” “Engaging ways of sharing content in the flipped classroom,” “Best practices for involving industry partners in the university classroom and laboratory,” “The history of a food science or nutrition topic,” or “Exploring the art and science of food” to name a few.

Finally, JFSE is building a "Food Science in Action" video resource library for K-12-STEM educators to use in the classroom, and we need your submissions! Create and submit a short video demonstrating food processing equipment, principles, or practices for a chance to win prizes and recognition at IFT15 in Chicago next July. Go to ift.org/FoodScienceInAction for more details and to upload your video.

Welcome each of you to join me in the mission of continuing to establish the JFSE as the premier journal on the teaching and learning of food science and technology. Here is to a bright future for food science and technology education!

~Shelly J. Schmidt
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References

6 Comprehensive Reviews in Food Science and Food Safety was also first published in April 2002.
7 The idea of teaching beside our students comes from the word pedagogy, which is derived from the Greek word for teaching (peada) which means “children” and aggeus which means “to lead.” Teaching occurred as an experienced adult walked beside a student to support and guide them on the correct path (Harcombe 2001).
8 The idea of sitting beside our students comes from the Latin word assidere, which literally means to sit beside the learner (Stefanakis 2002, p. 9).