Waterford Agricultural Sciences Program Highlights

1. **Executive Summary and Highlights**
   1. **Executive Summary**: Waterford Agricultural Sciences is a cutting-edge program that uses agricultural education as a venue for enhancing student comprehension of common core subjects (particularly science, mathematics, literacy, and communication) while maximizing student career- and college-readiness. Through an entirely novel curriculum utilizing breaking methods in education, Waterford Agricultural Sciences enables students to learn college-level material while demonstrating their command of the material through rigorous inquiry-based labs. In-class experiences are supported by a plethora of out-of-class opportunities including campus internships, paid research experiences, and school-to-work programs. Students can also take part in career-readiness programs for credit through structured independent study participation in FFA programs.
   2. **Unique CTE Highlights & Talking Points**:
      1. Waterford agricultural education offers a contemporary modern approach to teaching agricultural education.
         1. With an emphasis on universal relevance, agricultural courses are taught to maximize student performance in all subject areas while increasing student preparedness for college and future careers.
         2. Waterford agricultural courses are infused with heavy amounts of science, mathematics, literacy, communications, statistics, and STEM and the courses and assessments are modeled after the ACT exam in order to increase student performance on this assessment.
      2. Waterford is one of the first programs to be aligned to new state and national standards in agricultural education, NGSS, and common core.
         1. The program instructor, Craig Kohn, also served on the state AFNR standards committee and co-wrote the standards in biotechnology.
      3. Waterford’s curriculum is entirely written within the program and is used by thousands of teachers across the US and in other countries.
         1. This curriculum is uniquely designed to maximize the rigor and relevance of the content, steer students towards AFNR careers they otherwise might not have considered, and enable students to develop the ability to think critically, analyze data, apply their knowledge to solve problems, and address everyday concerns of their future adult lives.
         2. This curriculum also regularly includes career path exploration, college preparation, resume and cover letter writing, job interviews, and other direct career preparation activities.
      4. Waterford offers paid on-campus internships and research experiences to maximize student preparation for careers and for college.
         1. These internships and managerial positions are monitored by both the instructor as well as by elected student officers (similar to a Board of Directors to a corporation).
         2. Research internships are modeled and executed in a similar manner to research internships on a college campus and are funded by corporate donations.
         3. Currently there are 9 paid internship/managerial positions.
         4. There is no limit to the summer research scholar openings although students must demonstrate strong proficiency in their ability to design and conduct scientific research.
      5. Waterford FFA is designed to follow a cooperative business model, with students receiving paid dividends based on their involvement and investment.
         1. Financial literacy is an increasingly regular component of both ag course as well as their FFA experiences.
      6. Waterford’s program is closely aligned with breaking research and Kohn has close ties with the UW System, the US Department of Energy, the WDNR, TED, the Milwaukee Brewers, and many more organizations, companies, and agencies.
      7. Waterford Agricultural Sciences strongly incorporates technological literacy and tools to enhance curricular opportunities and the 21st century skills of students.
         1. All materials are posted on a website that is updated daily.
         2. Parents and students are emailed at least 1-2 times per week with course information and details about student opportunities.
         3. The programs are supported by two Twitter accounts, a Facebook page, and students are contacted directly through an SMS texting service.
      8. Response by the students has been very positive.
         1. Increases in enrollment and participation have required the hiring a second instructor.
         2. The second instructor hired in 2012 left to take a job in Seymour closer to his family. A second instructor was unable to be hired in 2013 due to high increases in demand for ag instructors across the state.
   3. **February 14th Visit**
      1. During the 11:00-12:15 time frame, Dr. Evers will have the opportunity to see the Large Animal Veterinary Science course.
         1. During this course, students are scheduled to conduct a peer review of their resumes. Students will use a checklist of requirements for a resume to assess whether a partner’s resume would increase or decrease their likeliness of being hired. Once they’ve received their feedback, students will have the opportunity to make corrections to their resume before submitting it to the instructor for final grade.
         2. Dr. Evers will also be given a tour of the facilities, have the opportunity to talk directly with students who take part in career-preparatory experiences outside of the classroom, and meet with FFA Officers who oversee and help run the program and its offerings.
         3. A detailed schedule will be provided once more information is confirmed.
2. **Detailed Information**
   1. **Location** – Waterford Union High School is located in Waterford, WI. What was once a small farming town was changed quickly due to a highway expansion that offered a direct connection to the greater Milwaukee area. Waterford Agricultural Sciences has a contemporary and modern approach to agricultural education, offering as much relevancy to a student with no farm background as it does to one with experience in production agriculture. This has been accomplished through the integration of rigorous science, emphasis on a wide variety of career preparatory options inside and outside of agriculture (including medicine, technology, engineering, and more), and through utilization of a college-preparatory atmosphere in all classes offered.
   2. **Philosophy** – “Classrooms should be engaging and living laboratories stimulating curiosity and fostering the ability to think critically and come to conclusions supported by credible evidence. Classrooms must be inclusive and reflect real-world applications in a manner that is relevant to the lives of students in order to prepare them for careers and for higher education. All students should leave a classroom better prepared to be responsible, problem-solving citizens with an ability to support a happy, healthy, and productive life."
   3. **Facilities** – courses and programs are supported by modern facilities that includes two full-size classrooms, a newly-renovated laboratory, a greenhouse, a business office, access to multiple computer labs, a department-specific supply of student laptops, landscape gardens, raised vegetable gardens, a livestock paddock, a chicken coop, a school forest, a research field, and more.
   4. **Student Body** – Waterford Union High School consists of nearly 1100 students. Waterford was recently named a top high school for two consecutive years by US News and World Report and consistently leads its conference in test scores and academic performance.
3. **Curriculum**
   1. **Classes Offered** – Waterford Agricultural Sciences offers 14 semesters of curriculum, including introductory Agriscience (proposed science elective), Veterinary Pet Care, Large Animal Veterinary Science, Natural Resources Environmental Science (Sci. Elective), Biotechnology and Bioenergy, Horticulture and Home Gardening (Sci. Elective), Greenhouse Management, Landscape Design, Agribusiness & Marketing, Advanced Leadership, Ag Coop (School-Work), Personal Preparation for Careers, and Summer Research Scholars.
   2. **Curriculum Content** – Waterford Agricultural Sciences is one of the first programs to be aligned to the new state and national AFNR standards as well as the Next Generation Science Standards (where applicable). Waterford’s Agricultural curriculum is designed to include among the most cutting-edge methodologies, including the Internally-Flipped Classroom method.
   3. **Teaching Style** – courses are taught in a manner that resembles post-secondary instruction, including a Discussion/Lecture/Lab weekly format. Midterm and Final Exams are structured to closely resemble how they would occur in a college situation and many course materials and course content is based directly on existing college courses in the UW system and beyond.
   4. **Teaching Structure** – students are guided through weekly units using the following structure:
      1. Monday: Introduction to the topic, followed by group and class discussion that allows students to become aware of the existing prior knowledge as well as the gaps in their knowledge.
      2. Tuesday: Notes using the internally-flipped classroom method in which students work independently or in small groups to teach themselves the material followed by question and answer sessions.
      3. Wednesday: Inquiry-based lab or group worksheet to allow students to demonstrate the knowledge they have acquired and show they comprehend the concepts enough to apply them to real-world scenarios.
      4. Thursday: group- and class review sessions followed by a quiz or assessment.
      5. Friday: Career Preparatory Lessons.
   5. **Common Core Integration** – Waterford Agricultural Science incorporates many different subjects and skills as a regular part of its mission to develop successful students who are college- and career-ready. Examples of Common Core integration include:
      1. Literacy: students in Veterinary Science classes use the novel *All Creatures Great and Small* to analyze case studies of veterinary care that are embedded throughout the book. Students must analyze and describe the symptoms and treatments and connect these to their current coursework while conducting oral exams on live animals.
      2. Mathematics: the use of data and graphs is an ever-present component of ag courses; students must use data to determine whether climate change has had a measurable impact on Wisconsin lakes, decide if a pet’s heart rate and circulation are within healthy ranges, determine the volume of materials needed for a landscape design project, assess the most profitable application of nutrients to a corn field, and more.
      3. Science: the ag instructor, Mr. Kohn, is a licensed science teacher with certifications in biology and environmental studies. Science is a major component of all applicable agricultural courses and these courses are aligned to NGSS.
      4. Communication: written and oral communication is a major component of all agriculture courses. Most notably, introductory Agriscience includes a long unit on science writing and requires students to present their research in a formal science format including either a research poster, proposal, or paper. Students also write numerous scientific papers, present research findings orally, and deliver sales pitches to obtain clients in courses such as Agribusiness and Landscape Design.
   6. **Rigor & Relevance**: course are designed to both prepare students for careers in particular fields in Agriculture, Foods, and Natural Resources, as well as prepare students for the day-to-day needs of their futures lives. For example, Veterinary Pet Care is designed to both prepare students for careers in medicine and animal science as well as enable them to address regular concerns that arise with pet ownership, such as feeding, grooming, and emergency responses. The Agribusiness course is aligned to teaching standards for economics and business education but also incorporates personal financial literacy on a regular basis.
4. **Career Preparation**
   1. **Course Career Preparation** – all agricultural courses are designed to increase the likelihood of gainful employment after high school. Most agricultural courses involve career path selection, college summaries, resume and cover letter writing, job interview skills, and employment strategies. All courses also require students to review career options and summarize career paths they otherwise might not have considered.
   2. **Career Profiles and Proficiencies** – students in most agricultural courses choose and summarize a career based on their interests and skills and describe the path they personally could take (including the choice of college and major) to obtain this career through the Career Profile and College Profile projects.
   3. **Ag Coop (School to Work)** – students can also receive course credit for on-the-job training that occurs in sync with their career preparatory education in the classroom. Waterford Agricultural Sciences is supported by a wide variety of businesses who take on student employees and participate in evaluations of students in 20 areas of employability.
   4. **Campus Internships** – Students can also receive career training through campus internships that occur within the high school. These include managerial positions for school facilities including the greenhouse and research field as well as internships related to campus animals, the school forest, the ag business office, and program marketing. All internship positions are paid either through funds raised by the activity (e.g. the poinsettia sale in the greenhouse) or through donations by area corporations (including Runzheimer Int’l).
   5. **Research and Science Careers** – Waterford Agricultural Sciences offers the Summer Research Scholars program. This summer course enables students to take part in designing and conducting independent research they have designed that has a positive permanent impact on the Waterford community. Students who take part in this program receive a research internship experience nearly identical in nature to those offered on college campuses. Their research is funded by grants from Runzheimer Int’l; students who complete the program and enroll in college also receive $2500 scholarships from Runzheimer.
5. **FFA & Leadership Development**
   1. **FFA as a Business** – Waterford Agricultural Sciences has a strong FFA chapter with roughly 100 members, making it the largest student organization at Waterford Union High School. The FFA is run as a business, modeling a cooperative business model. Students receive a dividend as a result of fundraising efforts and student workers are paid through funds raised by the program. A team of six elected officers contribute to the hiring of managers and interns and all finances are handled and recorded by students.
   2. **FFA and College/Career Readiness** – students in Waterford FFA take part in a wide array of college and career readiness opportunities. In addition to on-campus internships and managerial positions, dozens of students also regularly compete in Career Development Events (CDEs) focused on specific career clusters. The Environmental Science CDE team has won the state competition and advanced to national competition for the past two years. Waterford annually has students compete in speaking contest competitions and has competitors in career proficiency competitions.
   3. **Leadership Development** – Waterford FFA regularly sends students to the Halftime Leadership Conference and the 212 Leadership Conference as well as the State and National FFA Conventions.
   4. **Service** – members of Waterford FFA take part in many service activities. Waterford FFA has adopted a stretch of WI Hwy 20 and cleans this area 1-2 times per year. Every Halloween, Waterford FFA members volunteer at the Waterford Senior Living retirement home and ever Christmas, the Waterford FFA adopts a needy family and provides gifts for people in need. The Waterford FFA serves a teacher appreciation breakfast every February and many FFA members are involved in sustainability service projects, including invasive species removal, CWD testing, Fox River cleanup events, and more.
   5. **Personal Preparation for Careers** – starting next year, students will be able to take part in FFA activities for course credit. Students must align their participation in the FFA activities to needed preparation for specific careers as a way to obtain real-world career experiences inside and outside of the school day. To receive credit for their work, students must submit a proficiency application detailing their existing career preparation outside of school, participate in a speaking contest related to their career intentions, take part in a Career Development Event contest related to their career intentions, conduct scientific research in a related field, participate in a sustainability initiative relevant to their future career, and summarize their experiences and those experiences they would still need in a final career portfolio.
6. **Instructor** – Craig Kohn is a graduate of UW-Madison with degrees in Education and Agricultural Science and teaching certifications in agricultural education, biology, and environmental studies. Kohn grew up on a medium-sized dairy farm in Bonduel, WI where his experiences in developing health plans and procedures in dairy cattle enabled him to be accepted into the UW-Medical School at the age of 18. Kohn began to realize that he could accomplish more as a teacher than as a doctor when he took part in medical education programs designed to prevent high school and middle school students from abusing drugs and alcohol by showing those students the impact on organs (e.g. cirrhosis on the liver) due to substance abuse.   
     
   Kohn was a recipient of the UW Undergraduate Excellence award for the College of Ag and Life Sciences and was also named an Outstanding Sophomore earlier. Kohn was a recipient of a Gertrude Anthony Scholarship in the UW School of Education, for “students who show great promise as teachers.” Kohn was selected as a commencement speaker for his graduation in 2008 and also served as one of UW’s Bucky Badger mascots. Kohn is a graduate of UW’s Biocore Honors Biology program and was also accepted into the UW Medical Scholars program.   
     
   Kohn was hired by Waterford Union High School in 2008 to take over an agricultural education program that was in need of complete renovation and rethinking. Kohn rewrote all 14 semesters of courses offered and has personally designed and written his entire curriculum. This curriculum is widely used across all regions of the United States and his materials is regularly accessed by thousands of teachers.   
     
   Kohn has been the recipient of many awards and recognition. In December of 2013 he was one of six teachers awarded with the national Outstanding Young Member recognition from the National Association of Agricultural Educators. He was also the state winner of this award in that same year. Kohn received a prestigious Kohl Fellowship in April of 2012 and was named Agriscience Teacher of the Year in 2011. Kohn is the youngest recipient of Waterford’s staff excellence award and won a Tapestry Award from the National Science Teachers Association in 2009.   
     
   Kohn is a regular consultant for various agencies and programs. Kohn’s most notable and advanced work was with the Great Lakes Bioenergy Research Center of the US Department of Energy on the UW campus. Kohn was a part of the first Bioenergy Institute for Educators and also developed an assay for microbial enzymatic activity as part of a research experience teacher in the labs of Dr. Cameron Currie. Kohn has developed TED talks and curriculum on the subjects of bioenergy and on regenerative medicine and stem cell treatments. Kohn also regularly works with agencies and organizations including the Animal Sciences Department at UW-Madison, the Wisconsin DNR, PBS, the National Council on Agricultural Education, and many more.