



HOKKAIDO  
UNIVERSITY



Graduate School of  
Global Food Resources [Provisional name]  
Hokkaido University

In preparation for starting in Apr 2017



2016-2017  
Admission Guidebook



入試希望者向けガイドブック

○ 文部科学省に設置計画書提出中。記載内容は予定であり、変更する可能性があります。○

○ The plan for this school is currently under review by MEXT. Detailed plan of the new graduate school are still under development. ○



なぜ今「国際食資源学院」なのか??



# Why choose learning at the "Graduate School of Global Food Resources"?

## ① Learn how to deal with the global challenges

世界の問題にチャレンジする

Global demand for food is rapidly increasing. At the same time natural resources are under increasing pressure. Problems such as water shortages and pollution, loss of soil fertility and forests, degradation of coastlines and climate change are now becoming global challenges. This school aims to produce graduates who are ready to challenge these issues.

## ② "All English" curriculum

すべて英語で学ぶ

All the lectures will be given in English. For non-English speakers, it may be difficult at the beginning but learning in English will help you to develop a global career.

## ③ Studying in different countries while your studies

海外で学ぶ

Studying in different countries is a part of the course in this school. Learning different food production systems under different culture and climate help you understanding the issue of global food security and environment.

## ④ Develop broad knowledge and multifaceted perspectives

広い知識と大きな視野を持つ

Our curriculum covers very broad area, including social science, economics to molecular science. When you challenge different global issues in different parts of the world, the broad knowledge is very helpful to plan the strategies against them and to let different type of people act towards the solution

## ⑤ Cutting-edge research in the food resources and environment

食資源に関する先端研究

Our faculty members carry out cutting-edge research in the area of the Production, Environment and Governance. Students will learn how to tackle current problems in the food resources and environment by conducting the research with our research team.

## ⑥ Beautiful campus and good facilities

美しいキャンパスと充実した環境の中で学ぶ

We are located 7 minutes from the biggest train station in Hokkaido, Sapporo. The New Chitose International Airport is approximately 40 minutes from Sapporo station. Hokkaido is a famous spot for delicious locally produced foods which means our research environment is perfect to study "food resources".

# Curriculum / Program structure

カリキュラムの特徴と履修モデル

The Graduate School of Global Food Resources will provide an interdisciplinary international education that surpasses conventional curricular boundaries by integrating the humanities and the sciences. To acquire an overall understanding of the impacts of production, environment and governance on multi-layered food resource-related global issues, we will train international leaders with broad perspectives and high level of expertise who can identify, solve, and provide solutions to those problems.

A big feature of the curriculum is that students can learn at research institutes in Japan and abroad in “Wandervogel” study and from world level foreign faculty members invited from these institutes.

To complete the course, students have to acquire the required number of credits and to pass the examination for the research results of the master’s thesis or of specific issues.

## 33-credit master’s degree

Students are required to complete 21 credits as compulsory subjects, 6 credits compulsory elective subjects (theme subjects), 2 credits compulsory elective subjects (fieldwork subjects) and 4 credits from other subjects.

### Some of the compulsory subjects

- Introduction to Global Food Resources
- Production in Global Food Resources
- Environmental Sciences in Global Food Resources
- Governance in Global Food Resources
- Ethics in Global Food Resources
- Wandervogel Study in Global Food Resources
- Seminar in Global Food Resources
- Dissertation Research in Global Food Resources (year 2)

### Some of the compulsory elective subjects

- Bio-production and Technology
- Food and Health
- Environmental Resources Science
- Soil and Water Management
- Global Food Resource Economics
- Comparative Rural Sociology

### Some of the elective subjects

- Research Communication in Global Food Resources
- Food and Gastronomy
- Water-energy-food Nexus

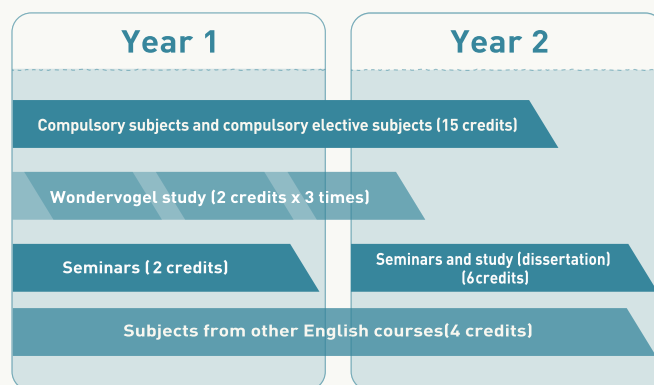
## Wandervogel (overseas) study

All students are required to attend multiple “Study Trips” in overseas. Some of the possible destinations for the trips are;

- Aarhus University – Denmark
- Patheingyi University – Myanmar
- International Rice Research Institute – Philippine
- Sydney University – Australia
- Lincoln University – New Zealand



## Example course structure



## Dissertation Research Process

- Based on lectures and experiences you have during the 1st year, you will complete a research proposal and it will be read by your supervisors (to be selected at the end of the 1st year).
- Once the proposal has been approved by your supervisor, you can start your own research.
- You may also apply for a fund to expand your research with your supervisor’s help.



## Food and health: Functional foods for animals and human

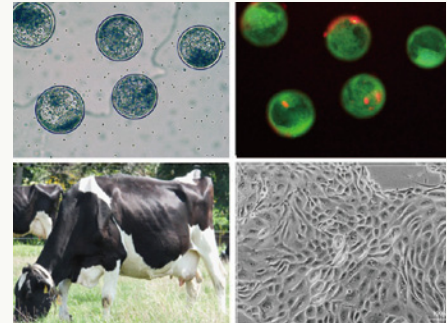
外部環境により引き起こされる活性酸素などの酸化ストレスによる傷害の低減は、健康な生活や食資源生産活動の継続に重要な課題です。私たちは、未利用生物資源などからの抗酸化物質の探索と酸化ストレス低減による健康増進や動物生産性の向上を目指しています。

Environmental stresses such as chemicals, foods, and high ambient temperature cause harmful effects to human health and livestock productivity. These harmful effects correlate with oxidative stress caused by reactive oxygen species (ROS). Increased ROS induces DNA damage, protein and lipid oxidations, alteration of gene expression, and epigenomic changes. These molecular and cellular damages might trigger diseases, aging, malfunction of both productive, reproductive performances to human and

livestock. Antioxidants are known to reduce ROS based oxidative stress to improve cell, tissue or organ functions. Natural resources such as plants, seaweeds or byproducts contain undermined potential antioxidants.

Thus our mission is to improve health and livestock productivity by reducing oxidative stress-related cellular damages with potential antioxidants from natural resources.

Researchers :  
Prof. Masashi Takahashi,  
Assoc. Prof. Seiji Takeda,  
Assist. Prof. Taichi Takasuka



## Biomass refinery: Development of novel crop & Enzyme

バイオマスリファイナリー技術の確立は未来の持続的なエネルギー確保に不可欠な問題です。私たちはバイオリファイナリー技術の実現を新しいバイオマス資源作物の作出と新規バイオマス分解酵素の発見および応用の両面から目指しています。

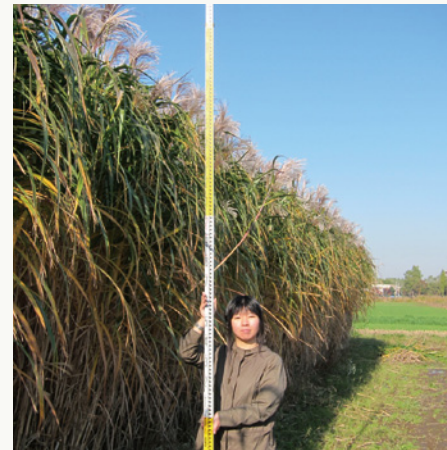
The world population is estimated to reach over the 10 billion in the next 50 years, and we need to ensure the food resources as well as energy supply for our future generations. However, the peak oil has been observed in the past 10 years, and the availability of fossil fuel is not expected to be adequate in the future.

Thus, our mission is to establish the ways to produce sustainable energy from nonedible feedstocks such as grass, strew, and new dedicate biomass crops, that are

readily degradable. Furthermore, the chemical pretreatment and enzymatic hydrolysis that suited to particular crops will be developed by both chemical and biochemical approaches.

Altogether, we will aim to produce sustainable and clean bioenergy to alter fossil fuel production to secure the future human life.

Reserchers :  
Prof. Toshihiko Yamada,  
Prof. Brian G. Fox,  
Assoc. Prof. Shota Atsumi,  
Assist.Prof. Taichi Takasuka



## Winemaking: Influence of global warming on “Terroir”

ワインは最もシンプルな発酵プロセスで作られ原料ブドウの特徴が品質に大きく反映されるので、地域ごとの特徴「テロワール」を持ちます。地球温暖化がワインのテロワールに及ぼす影響を解析していきます。

Wine is one of the most popular alcoholic beverage produced and consumed worldwide. The fermentation process of wine is simple and reflects local characteristics of grapes and other factors, called “Terroir” . The global warming will affect climate, one of the most important factors for the Terroir.

In the project, we will analyze many aspects of winemaking such as soils, vines, and fermentations using plant physiology,

microbiology and chemistry to find the variations caused by the climate change. These analyses will provide us novel knowledge on winemaking. Suggestion of suitable grape varieties for a particular location and water management, and microbial characterization of Terroir are the examples of expected outputs of the project.

Reseachers :  
Prof. Roger Boulton,  
Prof. Kentaro Inoue,  
Assoc. Prof. Teruo Sone,  
Assist. Prof. Mandy Bayer



## Designing sanitation value chain

2050年の世界人口は約90億人と推定されています。「人の健康・環境負荷低減・食糧増産・資源管理の関係性の中で、し尿・排水をどう扱えばよいか？」この間の答えが必要とされています。

Sanitation systems are essential for promoting public health, preventing pollution of soil and water system, conserving ecosystem, and recycling resources.

The question of how to handle the excreta and wastewater from 10 billion people on the earth is therefore highly relevant to the global environment.

The goal of our project is to propose the concept of "Sanitation Value Chain" as a common solution

of both developing and developed countries. We have organized the project team with specialists from Global Health, Sanitary Engineering, Agriculture, Economics, Sociology and Anthropology.

Researcher:  
Prof. Naoyuki Funamizu



## Biosensing technologies to investigate small world

環境中の微生物・化学物質・重金属などの作用機序を解明するためには、生体細胞内あるいはその近傍における遺伝子・糖・タンパク質・酵素などの微小物質の挙動を理解することが重要です。センシング技術を開発するとともにバイオセンサの実用化を目指しています。

Our mission is to develop the practical biosensors under the collaborations with companies, institutes, and other universities.

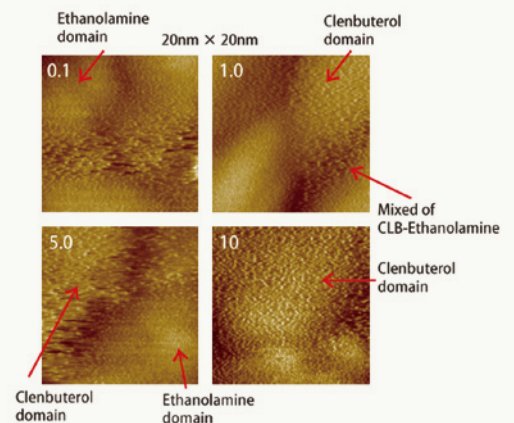
Biochemical reactions such as gene, sugar, protein, enzyme, chemicals etc., are not so complicated in an ideal condition, but it is very difficult to understand their behavior in practical condition.

For example, biochemical species forms a conjugate with a large matters in blood sample.

We aim to understand the basic response mechanism of biochemical species in ideal and practical conditions.



Researcher:  
Assoc. Prof. Toshikazu Kawaguchi



## Monitoring and predicting the effects of environmental changes

農地、森林などは、大気との間で熱、水、炭素などの物質を交換し、地球環境を整えるのに役立っています。この複雑なシステムを、プログラミングや野外観測、リモートセンシングなどを利用し研究しています。

Terrestrial ecosystem, composing of cropland, forest, rangeland, etc., is a quite large component in Earth's climate system.

Temporal and spatial distributions of exchange rates of heat, water, CO2 and other materials between ecosystem and atmosphere form global climate.

To know the current and future status of those materials' cycling, we conduct the field and satellite observations as well as ecological model simulation.

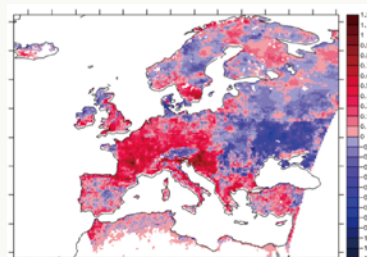


Fig. Simulated Future Vulnerability in Plant Production under Heat Wave

Researchers:  
Assist. Prof. Tomomichi Kato,  
Assist. Prof. Yoshitaka Uchida



## Fishery stock assessment in data poor situation

水産資源を持続的に利用していくために、資源量の把握が不可欠です。細かな漁獲物組成が得られれば、高度な解析ができますが、このような情報が得られない地域も少なくありません。データが不十分な状況でも、適切な資源管理を実施できるような資源量推定法を研究しています。

Population and its productivity of fishery stock are the key information for the sustainable fishery management.

Age based methods are widely used in northern countries, but are sometimes difficult to apply because of the difficulty of the age determination, and also the lack of the collecting system of fishery information.

We are examining the validity of Schaefer's production model applying to mixed species data.

The model is designed for single species, but in data-poor situation, catch statistics for each species is not available.

By using simulation study, we found that the recommended catch quota (MSY) calculated from the mixed data is near to the total of the single species MSY.

Researcher:  
Assoc. Prof. Takashi Matsui



## Tragedy and Survival of Peasants in Developing Countries

今日の発展途上国の農村問題には、どのような政策矛盾が起因しているのか問題提起します。植民地から独立後の開発独裁の農業政策、つまり近代化によって、農村が変容を遂げた歴史的検証が必要になります。また、途上国の農村は、グローバルゼーションの中で同様化し、格差に苦しみ、時に暴力的政治集団に巻き込まれています。

Why have the rural communities in the developing countries been marginalized by the Globalization today? We need to verify how the prototype of rural community in the developing countries did not adapt to the modernization during the colonization and development dictatorship. This contradictory process brought many economic problems and social and political conflicts.

Multidisciplinary approaches (political, anthropological, economical and sociological) are

used to criticize how the modernization (Nation State, production system, law and moral value) and agricultural policy of Development Dictatorship after the independence influenced the rural community's social structure.

Causality of this acculturation between internal and external elements will be clarified.

Researcher:  
Assoc. Prof. Takako Nabeshima



## Agricultural Economics: Supporting Farmers with Evidence-based Policy Evaluation

農業経済学では、グローバル化する経済環境において小規模農家や事業者が国際市場で生き残る上で不可欠な、新たな市場の開拓や農村組織の強化、生産性の向上をおとした農村開発・地域振興策の提言を行います。また、様々な政策オプションがある中、データや統計分析にもとづく実証的な政策評価のできる人材を育成します。

Our goal is to find ways to improve the welfare of smallholder farmers in the globalization era. For instance, increasing their productivity, improving their access to global markets, and establishing organizations to provide agricultural services are considered to be effective to enhance their likelihood to survive the global competition. By learning economics and statistics necessary to evaluate economic impacts of such policy

measures, students in our program will develop their skills to engage in evidence-based policy-making.

Researchers:  
Assoc. Prof. Tomoaki Nakatani,  
Assoc. Prof. Kuniyuki Kobayashi,  
Lecturer Yoko Saito



This school offers a Master's degree and the number of students to be admitted in year 2017 will be 15.

本学院は修士課程学生を募集しており、2017年度は15名の学生を募集しています。

We may not administer the second exam when the number of successful candidates has reached the capacity after the first exam.

前期入試で合格者が定員に達した場合、後期入試を行わない場合があります。

## Important dates 入試日程

### 2016 First exam 前期入試

Mid Sep 2016	Enrollment starts
Mid Oct	Application period
26 Nov 1 <sup>st</sup> day	Essay-type test
27 Nov 2 <sup>nd</sup> day	Presentation and interview
Early Dec	Announcement of exam results

### 2017 Second exam 後期入試

Mid Dec 2016	2nd enrollment starts
Mid Jan	Application period
Mid-late Feb 1 <sup>st</sup> day	Essay-type test
Mid-late Feb 2 <sup>nd</sup> day	Presentation and interview
Early March	Announcement of exam results

**To keep you updated**

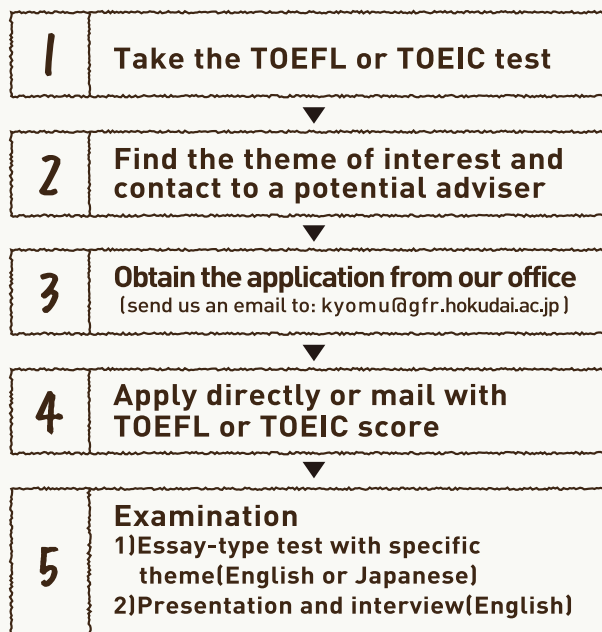
最新情報はウェブで  
チェックしてください

The tables above are tentative thus please follow us on;

Twitter: @GFR\_HU Facebook: GFR . HU



## Enrollment 入試までの流れ



### How to find the theme of interest and advisor

希望修学分野と指導教員の見つけ方

- Read "Research themes(p3-5)" and grasp the idea of this graduate school.
- Read "Meet the Faculty" and look at their websites, if available.
- Send an email to the address below to obtain further information.  
kyomu@gfr.hokudai.ac.jp.

### Additional info: graduate admission for Master's degree

試験科目の内容について

- General theme of essay will be given prior to the admission, and specific theme will be given on the day of admission.
- Presentation should include your past research experience and your intension of future research

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# Meet the Faculty



## Production



**Yoshinori  
OHTSUKA**

Health Science,  
Naturopathy,  
Nutrition and  
Metabolism



**Shuso  
KAWAMURA**

Agricultural and  
Food Process  
Engineering



**Masashi  
TAKAHASHI**

Animal  
Reproductive  
Physiology



**Toshihiko  
YAMADA**

Crop  
Production  
Science



**Teruo  
SONE**

Applied  
Microbiology



**Seiji  
TAKEDA**

Health  
Functional  
Foods



**Itsuro  
TAKAMURE**

Plant  
Breeding



**Taichi  
TAKASUKA**

Biochemistry,  
Microbial Sciences,  
Protein Sciences  
[www.agr.hokudai.ac.jp/  
takasuka/index\\_en.html](http://www.agr.hokudai.ac.jp/takasuka/index_en.html)

## Environment



**Takashi  
INOUE**

Land and  
Water  
Management



**Naoyuki  
FUNAMIZU**

Integrated  
Water  
Management



**Kazunobu  
ISHII**

Applied  
Bioproduction  
Engineering



**Yoshitaka  
UCHIDA**

Environmental  
Biogeochemistry  
[www.uchidalab.com](http://www.uchidalab.com)



**Toshikazu  
KAWAGUCHI**

Sensor and  
Environmental  
Engineering

[http://env.world.cocan.jp/  
env/Index.files/slide0003.htm](http://env.world.cocan.jp/env/Index.files/slide0003.htm)



**Junichi  
KASHIWAGI**

Soil  
Conservation



**Tomomichi  
KATO**

Plant Ecology,  
Agricultural  
Meteorology

## Governance



**Hajime  
KUBOTA**

Mathematical  
Economics



**Kuniyuki  
KOBAYASHI**

Rural Development,  
Food Network and  
Cooperatives



**Tomoaki  
NAKATANI**

Agricultural  
Economics,  
Economic  
Statistics



**Takako  
NABESHIMA**

Political  
Science of  
Rural Community



**Takashi  
MATSUIISHI**

Fish Stock  
Assessment

<http://matuisi.main.jp/>



**Yoko  
SAITO**

Agricultural  
Economics



## More information:

Twitter: @GFR\_HU    Facebook: GFR\_HU  
Student Affairs: [kyomu@gfr.hokudai.ac.jp](mailto:kyomu@gfr.hokudai.ac.jp)  
General Affairs: [shomu@gfr.hokudai.ac.jp](mailto:shomu@gfr.hokudai.ac.jp)