

Министерство сельского хозяйства Российской Федерации  
Федеральное государственное бюджетное образовательное  
учреждение  
высшего образования «Воронежский государственный аграрный  
университет имени императора Петра I»

**МЕТОДИЧЕСКИЕ УКАЗАНИЯ**  
для самостоятельной работы по дисциплине  
«Иностранный язык (английский язык)»  
(общий гуманитарный с социально-экономический учебный цикл)  
для обучающихся по специальности 35.02.15 Кинология

Воронеж

2018

Составители: старший преподаватель Т.В. Частухина, старший преподаватель Л.И. Лютова, к.п.н., доц. Соломатина

## ОГЛАВЛЕНИЕ

Пояснительная записка .....	4
1. Требования к уровню освоения содержания дисциплины .....	5
2. Формы контроля .....	8
3. Рекомендации по организации учебной деятельности .....	9
Организация работы на практических занятиях .....	10
Методические рекомендации по составлению монологических и диалогических высказываний по темам .....	11
Организация самостоятельной работы .....	12
Интерактивные методы обучения. ....	12
3.5. Методические рекомендации по составлению компьютерных презентаций .....	13
4. Учебные тексты .....	15

## **ПОЯСНИТЕЛЬНАЯ ЗАПИСКА**

Методические рекомендации и материалы составлены в соответствии с рекомендациями по планированию и организации самостоятельной работы обучающихся по дисциплине ОГСЭ.03 «Иностранный язык» всех специальностей и направлений аграрного профиля среднего профессионального образования.

Главная задача методических рекомендаций - помочь обучающимся овладеть умениями и навыками самостоятельной работы с учебной литературой, отвечать на поставленные вопросы, выделять главное, творчески подходить к решению практических задач.

Эта самостоятельная работа является внеаудиторной, поэтому важно подготовить обучающихся к выполнению заданий, объяснить им четкую схему подготовки и выполнения самостоятельной работы.

График выполнения самостоятельных работ позволяет определить объем изучаемого материала, формы контроля, время и сроки выполнения. Основной формой контроля самостоятельной работы являются практические занятия, контрольные работы, индивидуальные задания, защита творческих работ на занятиях.

Показателем оценки результатов внеаудиторной самостоятельной работы обучающегося являются:

- уровень освоения учебного материала;
- умение использовать теоретические знания на практике;
- обоснованность и четкость изложения ответа;
- оформление материала в соответствии с требованиями.

# 1. ТРЕБОВАНИЯ К УРОВНЮ ОСВОЕНИЯ СОДЕРЖАНИЯ ДИСЦИПЛИНЫ

Содержание дисциплины ОГСЭ.03 «Иностранный язык» направлено на достижение следующих *целей*:

- дальнейшее развитие иноязычной коммуникативной компетенции;
- развитие способности и готовности к самостоятельному изучению иностранного языка, дальнейшему самообразованию с его помощью, использованию иностранного языка в других областях знаний.

Иноязычная коммуникативная компетенция предусматривает развитие языковых навыков (грамматика, лексика, фонетика и орфография) и коммуникативных умений в основных видах речевой деятельности: говорении, аудировании, чтении и письме. Предметное содержание речи содержит лексические темы для общения в различных коммуникативных ситуациях.

Освоение учебного предмета "Иностранный язык" на базовом уровне направлено на достижение обучающимися порогового уровня иноязычной коммуникативной компетенции в соответствии с требованиями к предметным результатам ФГОС СОО, достижение которых позволяет выпускникам самостоятельно общаться в устной и письменной формах как с носителями изучаемого иностранного языка, так и с представителями других стран, использующими данный язык как средство коммуникации, и в соответствии с "Общеввропейскими компетенциями владения иностранным языком".

В результате освоения учебной дисциплины обучающийся должен **уметь**:

## **Коммуникативные умения**

### Говорение

#### Диалогическая речь

Уметь без подготовки инициировать, поддерживать и заканчивать беседу на темы, включенные в раздел "Предметное содержание речи". Уметь выражать и аргументировать личную точку зрения, давать оценку. Уметь запрашивать информацию в пределах изученной тематики. Уметь обращаться за разъяснениями и уточнять необходимую информацию.

#### Монологическая речь

Уметь формулировать несложные связные высказывания в рамках тем, включенных в раздел "Предметное содержание речи". Использовать

основные коммуникативные типы речи (описание, повествование, рассуждение, характеристика). Уметь передавать основное содержание текстов. Уметь кратко высказываться с опорой на нелинейный текст (таблицы, диаграммы, расписание и т.п.). Уметь описывать изображение без опоры и с опорой на ключевые слова/план/вопросы. Уметь предоставлять фактическую информацию.

### Аудирование

Уметь понимать на слух основное содержание несложных аудио- и видеотекстов различных жанров (радио- и телепрограмм, записей, кинофильмов) монологического и диалогического характера с нормативным произношением в рамках изученной тематики. Выборочно понимать детали несложных аудио- и видеотекстов различных жанров монологического и диалогического характера. Полно и точно воспринимать информацию в распространенных коммуникативных ситуациях. Уметь обобщать прослушанную информацию.

### Чтение

Уметь читать (вслух и про себя) и понимать простые аутентичные тексты различных стилей и жанров. Использовать различные виды чтения (ознакомительное, изучающее, поисковое, просмотровое) в зависимости от коммуникативной задачи. Уметь отделять в прочитанных текстах главную информацию от второстепенной, выявлять наиболее значимые факты, выражать свое отношение к прочитанному. Уметь читать и достаточно хорошо понимать простые аутентичные тексты различных стилей и жанров.

### Письмо

Уметь составлять несложные связные тексты в рамках изученной тематики. Уметь писать личное (электронное) письмо, заполнять анкету, письменно излагать сведения о себе. Уметь описывать явления, события. Уметь излагать факты, выражать свои суждения и чувства. Уметь письменно выражать свою точку зрения в форме рассуждения, приводя аргументы и примеры. Уметь письменно сообщать свое мнение по поводу фактической информации в рамках изученной тематики.

## **Языковые навыки**

### Орфография и пунктуация

Уметь расставлять в тексте знаки препинания в соответствии с нормами, принятыми в стране изучаемого языка.

### Фонетическая сторона речи

Уметь выражать модальные значения, чувства и эмоции с помощью интонации, в том числе интонации в общих, специальных и разделительных

вопросах. Уметь четко произносить отдельные фонемы, слова, словосочетания, предложения и связные тексты. Уметь правильное произносить ударные и безударные слоги слов в предложениях. Уметь произносить звуки изучаемого иностранного языка без выраженного акцента.

### Грамматическая сторона речи

Уметь распознавать и употреблять в речи основные синтаксические конструкции в соответствии с коммуникативной задачей. Распознавать и употреблять в речи коммуникативные типы предложений, как сложных (сложносочиненных, сложноподчиненных), так и простых. Распознавать и употреблять в устной и письменной коммуникации различные части речи. Употреблять в речи эмфатические конструкции. Уметь использовать в речи предложения с различными грамматическими конструкциями.

### Лексическая сторона речи

Уметь распознавать и употреблять в речи лексические единицы в рамках тем, включенных в раздел "Предметное содержание речи", в том числе в ситуациях формального и неформального общения. Распознавать и употреблять в речи наиболее распространенные устойчивые словосочетания, оценочную лексику, реплики-клише речевого этикета. Распознавать и употреблять в речи наиболее распространенные фразовые глаголы. Определять части речи по аффиксу. Распознавать и употреблять в речи различные средства связи для обеспечения целостности высказывания.

В результате освоения учебной дисциплины обучающийся должен **знать:**

- значения новых лексических единиц, связанных с тематикой данного этапа и с соответствующими ситуациями общения;
- языковой материал: идиоматические выражения, оценочную лексику, единицы речевого этикета в рамках изучаемых тем;
- новые значения изученных глагольных форм (видо-временных, неличных);
- лингвострановедческую, страноведческую и социокультурную информацию, расширенную за счет новой тематики и проблематики речевого общения;
- тексты, построенные на языковом материале повседневного и профессионального общения, в том числе инструкции и нормативные документы по профессии.

В результате освоения учебной дисциплины у учащегося должны быть сформированы следующие **компетенции:**

- речевая компетенция – совершенствование коммуникативных умений в четырех основных видах речевой деятельности (говорении, аудировании, чтении и письме); умений планировать свое речевое и неречевое поведение;
- языковая компетенция – овладение новыми языковыми средствами в соответствии с отобранными темами и сферами общения: увеличение объема используемых лексических единиц; развитие навыков оперирования языковыми единицами в коммуникативных целях;

-социокультурная компетенция – увеличение объема знаний о социокультурной специфике страны/стран изучаемого языка, совершенствование умений строить свое речевое и неречевое поведение адекватно этой специфике, формирование умений выделять общее и специфическое в культуре родной страны и страны изучаемого языка;

-компенсаторная компетенция – дальнейшее развитие умений объясняться в условиях дефицита языковых средств при получении и передаче иноязычной информации;

-учебно-познавательная компетенция – развитие общих и специальных учебных умений, позволяющих совершенствовать учебную деятельность по овладению иностранным языком, удовлетворять с его помощью познавательные интересы в других областях знания;

В результате освоения учебной дисциплины обучающийся должен **приобрести практический опыт** для:

– общения с представителями других стран, ориентации в современном поликультурном мире;

– получения сведений из иноязычных источников информации (в том числе через Интернет), необходимых в образовательных и самообразовательных целях;

– расширения возможностей в выборе будущей профессиональной деятельности;

– изучения ценностей мировой культуры, культурного наследия и достижений других стран; ознакомления представителей зарубежных стран с культурой и достижениями России.

## 2. ФОРМЫ КОНТРОЛЯ

В процессе изучения дисциплины предусмотрены следующие формы контроля: текущий контроль, промежуточный контроль, контроль самостоятельной работы.

**ТЕКУЩИЙ КОНТРОЛЬ** осуществляется в течение семестра в виде устного опроса обучающихся на практических занятиях, в виде письменных проверочных работ по текущему материалу. Устные ответы и письменные работы оцениваются преподавателем. Оценки доводятся до сведения обучающихся.

**ПРОМЕЖУТОЧНЫЙ КОНТРОЛЬ** осуществляется в форме экзамена  
Содержание экзамена.

1. Чтение и письменный перевод со словарем аутентичного текста по теме научного исследования обучающегося.
2. Ознакомительное чтение аутентичного текста по теме научного исследования обучающегося. Резюме текста на иностранном языке.
3. Беседа на иностранном языке о научной работе обучающегося

Контроль самостоятельной работы обучающихся осуществляется в течение всего семестра. Преподаватель самостоятельно определяет формы контроля



самостоятельной работы студентов в зависимости от содержания разделов и тем, выносимых на самостоятельное изучение. Такими формами могут являться: тестирование, презентации и т.д. Результаты контроля самостоятельной работы обучающихся учитываются при осуществлении промежуточного контроля по дисциплине.

### 3. РЕКОМЕНДАЦИИ ПО ОРГАНИЗАЦИИ УЧЕБНОЙ ДЕЯТЕЛЬНОСТИ ОБУЧАЮЩИХСЯ

#### ОРГАНИЗАЦИЯ РАБОТЫ НА ПРАКТИЧЕСКИХ ЗАНЯТИЯХ

Практические занятия – главное звено дидактического цикла обучения.

Цель практических занятий – формирование у обучающихся основы для последующего усвоения материала методом самостоятельной работы. Для того, чтобы добиться успеха в изучении иностранного языка, необходимо заниматься языком систематически. Эффективность практических занятий в значительной степени определяется правильным выбором одной из учебно-образовательных технологий, которые служат реализации познавательной и творческой активности обучающихся в учебном процессе. Таким образом, в процессе освоения дисциплины ОГСЭ.03 «Иностранный язык» применяются современные образовательные технологии, дающие возможность повышать качество образования, более эффективно использовать учебное время.

Технологии, применяемые в учебном процессе:

- личностно-ориентированная технология, которая предполагает раскрытие индивидуальности каждого в процессе обучения иностранному языку в высшей школе. Цель такого обучения состоит в создании системы психолого-педагогических условий, позволяющих работать с каждым обучающимся с учетом индивидуальных познавательных возможностей, потребностей и интересов;
- технология проблемного обучения представляет собой создание в учебной деятельности проблемных ситуаций и организация активной самостоятельной деятельности обучающихся, в результате чего происходит творческое овладение знаниями, умениями, навыками;
- технология проектных методов обучения представляет собой работу по развитию индивидуальных творческих способностей обучающихся;
- технология исследовательских методов дает возможность обучающемуся самостоятельно пополнять свои знания, глубоко вникать в изучаемую проблему и предполагать пути ее решения, что важно при формировании мировоззрения, в том числе на иностранном языке;
- технология использования игровых методов (ролевые игры) способствует расширению кругозора, развитию познавательной деятельности, формированию определенных умений и навыков, необходимых в практической деятельности;

- технология обучения в сотрудничестве (командная, групповая работа) рассматривает сотрудничество как идею совместной развивающей деятельности;
- информационно-коммуникационные технологии позволяют обогащать содержание обучения иностранному языку через доступ в Интернет.

## МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ ПО СОСТАВЛЕНИЮ МОНОЛОГИЧЕСКИХ И ДИАЛОГИЧЕСКИХ ВЫСКАЗЫВАНИЙ ПО ТЕМАМ

Обучение говорению как процессу продуктивному, то есть требующему от обучающихся построения высказывания, обусловленного ситуацией общения, представляет собой сложную методическую задачу. Это связано с наибольшими трудностями для обучающихся и требует больших затрат времени и усилий как со стороны преподавателя, так и студентов. Говорение может выступать в форме монологического (связного) высказывания и диалогического — беседы (хотя такое разграничение несколько искусственно). Говорению как цели обучения должна предшествовать работа над языковым и речевым материалом. Иными словами, учащимся нужно обеспечить достаточную тренировку в правильности фонетического, грамматического и лексического оформления высказываний.

Формированию говорения служат две группы упражнений: тренировочные и творческие. Монологическая речь представлена главным образом описанием, сообщением, рассказом о прослушанном, прочитанном. Однако обучение монологу идет без строгого разграничения по типам высказывания, так как здесь происходит усиленное накопление языкового материала.

### Работа над монологом:

Работу по подготовке устного монологического высказывания по определенной теме следует начать с изучения тематических текстов-образцов. В первую очередь необходимо выполнить фонетические и лексические и лексико-грамматические упражнения по изучаемой теме, усвоить необходимый лексический материал, прочитать и перевести тексты-образцы, выполнить речевые упражнения по теме. Затем на основе изученных текстов нужно подготовить связное изложение, включающее наиболее важную и интересную информацию. При этом необходимо произвести обработку материала для устного изложения с учетом индивидуальных возможностей и предпочтений студента, а именно:

1) заменить трудные для запоминания и воспроизведения слова известными лексическими единицами:

All people are proud of their magnificent capital - All people are proud of their great capital;

2) сократить «протяженность» предложений:

Culture is a term used by social scientists for a people's whole way of life. - Culture is a term used for the whole people's way of life.

3) упростить грамматическую (синтаксическую) структуру предложений: I felt I was being watched I felt somebody was watching me.

3) произвести смысловую (содержательную) компрессию текста: сократить объем текста до оптимального уровня (не менее 12-15 предложений).

Обработанный для устного изложения текст необходимо записать в рабочую тетрадь, прочитать несколько раз вслух, запоминая логическую последовательность освещения темы, и пересказать.

Работа над диалогом:

- Составлять и осуществлять монологические высказывания по профессиональной тематике (презентации, выступления, инструктирование);
- самостоятельно прочитать и осмыслить текст;
- потренировать отдельные выражения в кратких речевых ситуациях;
- выразительно прочитать диалог по ролям;
- выучить свою роль и инсценировать диалог.

### ОРГАНИЗАЦИЯ САМОСТОЯТЕЛЬНОЙ РАБОТЫ

Особенностью изучения иностранного языка является то, что большая часть языкового материала должна прорабатываться самостоятельно.

Самостоятельная работа является неотъемлемой частью обучения иностранному языку.

На самостоятельное изучение выносятся задания, направленные на:

- закрепление грамматических и лексических языковых средств, необходимых для формирования коммуникативной компетенции;
- понимание устной и письменной речи в различных коммуникативных ситуациях;
- работу с электронными специальными словарями и энциклопедиями, с электронными образовательными ресурсами;
- овладение и закрепление основной терминологии по направлению.

Самостоятельная работа может быть аудиторной (выполнение отдельных заданий на занятиях) и внеаудиторной.

Для выполнения самостоятельной работы используются:

1. Учебники и учебные пособия.
2. Мультимедийные средства: работа в сети Интернет (использование обучающих программ и учебных сайтов, электронных образовательных ресурсов).

### ИНТЕРАКТИВНЫЕ МЕТОДЫ

Интерактивный метод (от англ. inter – «между»; act – «действие») – это метод взаимодействия, режим диалога, беседы. Он ориентирован на более широкое взаимодействие обучающихся не только с преподавателем, но и друг с другом и на доминирование активности учащихся в процессе обучения. Эти методы предполагают со-обучение (коллективное, обучение в

сотрудничестве), причем и обучающийся и педагог являются субъектами учебного процесса.

Проведение дискуссии. Цель - достижение практического владения средствами иностранного языка, позволяющего использовать их для осуществления эффективной коммуникации в деловом общении и кросскультурной среде.

Использование данного метода формирует у обучающихся лингвистические компетенции, позволяющие свободно комментировать, сравнивать и интерпретировать статистическую значимую информацию, вести ситуативную беседу в рамках темы, совершенствовать навыки ведения дискуссии по профессиональным проблемам.

Презентация. Качественная презентация зависит от следующих параметров: постановки темы, цели и плана выступления; определения продолжительности представления материала; адресованности материала; интерактивных действий выступающего (включение в обсуждение слушателей); манеры представления презентации: соблюдение зрительного контакта с аудиторией, выразительность; наличия иллюстраций (не перегружающих изображаемое на экране), ключевых слов.

## МЕТОДИЧЕСКИЕ РЕКОМЕНДАЦИИ ПО СОСТАВЛЕНИЮ КОМПЬЮТЕРНЫХ ПРЕЗЕНТАЦИЙ

КОМПЬЮТЕРНУЮ ПРЕЗЕНТАЦИЮ удобнее всего подготовить в программе MS Power Point. Презентация как документ представляет собой последовательность сменяющих друг друга слайдов - то есть электронных страничек, занимающих весь экран монитора (без присутствия панелей программы). Чаще всего демонстрация презентации проецируется на большом экране. Количество слайдов адекватно содержанию и продолжительности выступления (например, для 5-минутного выступления рекомендуется использовать не более 7 слайдов).

Презентация создается индивидуально или в группе.

Работа может быть представлена либо в электронном варианте, либо напечатана на бумаге формата А4 (на одном листе – один слайд).

Выполненную работу сдать к указанному сроку.

Первый слайд обязательно должен содержать Ф.И.О. студента, название учебной дисциплины, тему презентации, Ф.И.О. преподавателя. Следующие слайды можно подготовить, используя две различные стратегии их подготовки:

1 стратегия: на слайды выносятся опорный конспект выступления и ключевые слова с тем, чтобы пользоваться ими как планом для выступления. В этом случае к слайдам предъявляются следующие требования:

- объем текста на слайде – не больше 7 строк;
- маркированный/нумерованный список содержит не более 7 элементов;
- отсутствуют знаки пунктуации в конце строк в маркированных и нумерованных списках;

- значимая информация выделяется с помощью цвета, начертания, эффектов анимации.

Особо внимательно необходимо проверить текст на отсутствие ошибок и опечаток. Основная ошибка при выборе данной стратегии состоит в том, что выступающие заменяют свою речь чтением текста со слайдов.

2 стратегия: на слайды помещается фактический материал (таблицы, графики, фотографии и пр.), который является уместным и достаточным средством наглядности, помогает в раскрытии стержневой идеи выступления. В этом случае к слайдам предъявляются следующие требования:

- выбранные средства визуализации информации (таблицы, схемы, графики и т. д.) соответствуют содержанию;
- использованы иллюстрации хорошего качества (высокого разрешения), с четким изображением (как правило, никто из присутствующих не заинтересован вчитываться в текст на ваших слайдах и всматриваться в мелкие иллюстрации);

Максимальное количество графической информации на одном слайде – 2 рисунка (фотографии, схемы и т.д.) с текстовыми комментариями (не более 2 строк к каждому). Наиболее важная информация должна располагаться в центре экрана.

Последний слайд должен быть повторением первого. Это дает возможность еще раз напомнить слушателям тему выступления и имя докладчика, либо перейти к вопросам, либо завершить выступление.

#### Оформление презентации

Для всех слайдов презентации по возможности необходимо использовать один и тот же шаблон оформления, размер – для заголовков - не меньше 24 пунктов, для информации - не менее 18.

В презентациях не принято ставить переносы в словах.

Оформление слайдов не должно отвлекать от его содержания. Нежелательны звуковые эффекты в ходе демонстрации презентации. Наилучшими являются контрастные цвета фона и текста (белый фон – черный текст; темно-синий фон – светло-желтый текст и т. д.). Неконтрастные слайды будут смотреться тусклыми и невыразительными, особенно в светлых аудиториях.

Лучше не смешивать разные типы шрифтов в одной презентации. Рекомендуется не злоупотреблять прописными буквами (они читаются хуже).

Для лучшей ориентации в презентации по ходу выступления лучше пронумеровать слайды. Желательно, чтобы на слайдах оставались поля, не менее 1 см с каждой стороны.

Вспомогательная информация (управляющие кнопки) не должны преобладать над основной информацией (текстом, иллюстрациями).

Табличная информация вставляется в материалы как таблица текстового процессора MS Word или табличного процессора MS Excel. При вставке таблицы как объекта и пропорциональном изменении ее размера

реальный отображаемый размер шрифта должен быть не менее 18. Таблицы и диаграммы размещаются на светлом или белом фоне.

#### **Общие критерии оценки:**

1. Выразительность и оригинальность стиля.
2. Ясность написания текстов. Необходимо правильно определить оптимальный объем информации – ее должно быть достаточно для раскрытия какого-то вопроса, но не должно быть слишком много, что повлечет за собой уменьшение размера шрифта и негативно скажется на «читаемости» текста.
3. Продуманность деталей.
4. Целесообразное использование стилей и шрифтов.
5. Привлекательность общего дизайна.
6. Соответствие размещения и содержания информации общей идее.

#### 4. УЧЕБНЫЕ ТЕКСТЫ

### **AGRICULTURE**

Agriculture, also called farming or husbandry, is the cultivation of animals, plants, fungi, and other life forms for food, fiber, biofuel, medicinals and other products used to sustain and enhance human life. Agriculture was the key development in the rise of sedentary human civilization, whereby farming of domesticated species created food surpluses that nurtured the development of civilization. The study of agriculture is known as agricultural science. The history of agriculture dates back thousands of years, and its development has been driven and defined by greatly different climates, cultures, and technologies. However, all farming generally relies on techniques to expand and maintain the lands that are suitable for raising domesticated species. For plants, this usually requires some form of irrigation, although there are methods of dryland farming. Livestock are raised in a combination of grassland-based and landless systems, in an industry that covers almost one-third of the world's ice- and water-free area. In the developed world, industrial agriculture based on large-scale monoculture has become the dominant system of modern farming, although there is growing support

for sustainable agriculture, including permaculture and organic agriculture.

Until the Industrial Revolution, the vast majority of the human population labored in agriculture. Pre-industrial agriculture was typically subsistence agriculture/self-sufficiency in which farmers raised most of their crops for their own consumption instead of cash crops for trade. A remarkable shift in agricultural practices has occurred over the past century in response to new technologies, and the development of world markets. This also has led to technological improvements in agricultural techniques, such as the Haber-Bosch method for synthesizing ammonium nitrate which made the traditional practice of recycling nutrients with crop rotation and animal manure less important.

Modern agronomy, plant breeding, agrochemicals such as pesticides and fertilizers, and technological improvements have sharply increased yields from cultivation, but at the same time have caused widespread ecological damage and negative human health effects. Selective breeding and modern practices in animal husbandry have similarly increased the output of meat, but have raised concerns about animal welfare and the health effects of the antibiotics, growth hormones, and other chemicals commonly used in industrial meat production. Genetically modified organisms are an increasing component of agriculture, although they are banned in several countries. Agricultural food production and water management are increasingly becoming global issues that are fostering debate on a number of fronts. Significant degradation of land and water resources, including the depletion of aquifers, has been observed in recent decades, and the effects of global warming on agriculture and of agriculture on global warming are still not fully understood.

The major agricultural products can be broadly grouped into foods, fibers, fuels, and raw materials. Specific foods include cereals (grains), vegetables, fruits, oils, meats and spices. Fibers include cotton, wool, hemp, silk and flax. Raw materials include lumber and bamboo. Other useful materials are produced by plants, such as resins, dyes, drugs,

perfumes, biofuels and ornamental products such as cut flowers and nursery plants. Over one third of the world's workers are employed in agriculture, second only to the services sector, although the percentages of agricultural workers in developed countries has decreased significantly over the past several centuries.

## **BRITISH AGRICULTURE**

Great Britain is a highly developed industrial country. In spite of the mild climate favourable for agriculture only 20 per cent of the population live in the country-side and only 7 per cent of the population are engaged in farming.

British agriculture depends on climatic conditions and types of soil. About a third of British agricultural land is arable and the rest are pastures and meadows. The agricultural area is toward the English Channel and the continent of Europe.

The climate of Great Britain is mild and damp. The temperature seldom exceeds 30° C or falls below zero. Thus farmers work in the fields all the year round. The cool and mild climate and sufficient rainfalls are favourable for growing all kinds of crops and for animal husbandry.

The soil in many parts of Highland Britain is thin and poor. Sheep-farming and cattle breeding are typical of this zone. Lowland Britain is a rich area with fertile soil. Dairy breeding and poultry farming, horticulture and arable (crop) farming are wide spread here.

Wheat, oats and barley are the main grain crops, sugar beets and potatoes are the chief root crops. The fruits grown are apples, pears, plums, cherries and berries. The main agricultural products of Britain are wheat, barley, oats, potatoes, milk and different kinds of meat.

The types of farms are different in different soil and climatic areas. The greater part of the land in Great Britain belongs to landowners.



Small traditional farms are usually mixed farms on which farmers both grow crops and keep farm animals. But now small farms are gradually disappearing because they cannot compete with modern big industrial farms.

Most of the British farms are highly mechanized. Farmers use tractors, different planting machines and combine-harvesters. Mineral fertilizers and chemical means of plant protection are applied on a large scale. British farmers are very skilled and active in their work. They produce enough food required by the vast industrial population. Only some part of the Britain's food supply, such as tea, coffee and exotic fruits, is imported.

## **USA AGRICULTURE**

Nearly 400 years ago European colonists came to America. The colonists began to settle. They cleared the land and transformed forests into croplands and pastures. The settlers lived in a group of houses around a central field. Here the village cattle was grazed.

In 1862 the government gave land away free. A settler had to clear it, build a house and live there for at least five years. There appeared family farms. Over time, farming methods improved and farming areas increased. Today the average farm in the USA comprises 187 ha (462 acres). American farms became more efficient. Many farms adopted new technologies. Computers helped them to improve productivity and cut costs. In the 1990s American farmers invested more than \$ 400 billion in land, livestock, buildings and equipment. American consumers pay less for their food than the people of many other industrial countries. By the mid-1970s a single farmer could grow enough food to feed himself, 45 other Americans and 8 foreigners.

Most of the farms in the USA are family farms. Only 3 percent of them are led by corporations that are owned by families. People who

have small pieces of land cannot invest in the modern equipment. Often they sell their land to other farmers. There are tenant farmers who rent this land for cash or give the owner a part of the crops they grow. Owners of large farms hire seasonal workers. Many of these seasonal workers travel from farm to farm. They stay only for the period of picking crops. They are known as migrant workers.

The Northeast region does not have large areas of good land. But you can find dairy and poultry farms in several areas. Maine is famous for potatoes.

The Great Lakes region is also an important area for farming. Corn, wheat and dairy products are the most important agricultural items. Farmers often rotate soybeans – that is, planting corn in a field one year and soybeans the next. The region has enough rainfall, which is very important for hay, grown to feed dairy cattle. Wisconsin is the most important dairy state in the region.

The South is famous for tobacco. The moist, warm climate contributes to the extensive growth of tobacco in Virginia, North Carolina and South Carolina. Cotton is another important crop for southern farmers, especially in Arkansas and Mississippi. Peanuts are grown in Georgia, citrus fruits and vegetables in Florida, Soybeans is an important crop in Arkansas.

The Great Plains region is considered the «American breadbasket». It yields great quantities of crops, especially wheat. Wheat is important in Kansas, Minnesota, Nebraska, and the Dakotas. Iowa receives more rainfall than the states in the west, so corn is grown instead of wheat. It is the leading state in the USA in corn production. Texas leads the country in the number of cattle and sheep. Here vegetables and citrus fruit, wheat and cotton are grown too.

The Rocky Mountains region lacks water. So many farmers raise livestock. The cattle and sheep require a lot of land to graze. Many of the ranches are very large. Their sizes can be over 900 hectares.

California leads the Pacific region in farming. It is the leading grower of fruits and vegetables. The farms produce cattle, dairy products, cotton, grapes, tomatoes, and citrus fruits. In Washington cherries and apples are major fruits. Farms in Hawaii grow sugarcane and pineapples.

Now the US agriculture is a big business and is a part of the country's economy.

Agrobusiness includes farmer cooperatives, rural banks, shippers of farm products, firms that manufacture farm equipment, food-processing industries and many other businesses. American agriculture exports its crops to Europe, Asia, Africa and Latin America. The United States produces half of the world's soybeans and corn for grain, and from 10 to 25 percent of the world's cotton, wheat, tobacco and vegetable oils.

## **INTRODUCTION TO VETERINARY**

Veterinary was founded many thousand years ago in relation with man's requirements. The word "veterinarius" is a Latin word. It means taking care of animals and treatment of livestock. The development of veterinary is connected with domestication of wild animals.

Veterinary Science is also called veterinary medicine and includes the prevention, diagnosis, and treatment of the diseases of domestic animals and the management of other animal disorders. The field also deals with those diseases that are intercommunicable between animals and humans. Farm animals are susceptible to various infectious diseases and may suffer from viruses and harmful bacteria, so animals should be examined by veterinary surgeons regularly in order to notice disease symptoms in time and take the necessary preventive and control measures. Such common animal diseases as mastitis, brucellosis, swine fever, anthrax, and leptospirosis can quickly spread and cause major

losses among stock animals, so they must be controlled or prevented by veterinary surgeons.

Vaccination and immunization, sanitary measures, and the severe segregation, or quarantine of sick animals should be used by farmers and veterinary surgeons to prevent the spread of infectious diseases such as anthrax, bovine tuberculosis, brucellosis, canine distemper, and rabies. Sanitary control of animal housing and proper pasture management are to eliminate any carriers of animal infectious diseases which can be easily transmitted by water and soil.

The pathologic changes in the body which follow disturbances in various organs or parts of organs disclose facts of great importance to the veterinarians.

Veterinary surgeons also treat parasitical infections, unsanitary conditions which may cause lower fertility in livestock, and nutritional disorders.

A veterinary surgeon's training must include the study of the basic preclinical disciplines of anatomy, histology, physiology, pharmacology, microbiology, bacteriology, virology, parasitology, and pathology. The clinical subjects of study may be divided into internal medicine, preventive medicine, surgery and clinical practice. Internal medicine includes the diagnosis and treatment of diseases as they affect animals. Preventive medicine should consider the aspects of disease prevention and control, especially such diseases that can be transmitted between animals and humans or diseases that may influence human health. Surgery includes wound treatment, fracture repair, the excision of body parts and the use of such techniques as radiology, anesthesiology, obstetrics, treatment of lameness, etc.

Veterinary depends on several disciplines. Knowledge of Physics is essential in understanding the function of the heart and blood vessels, the mechanics of respiration, the formation of images in the eye, and the transmission of sound waves in the ear.

Knowledge of Chemistry is indispensable in unraveling secrets of digestion and metabolism and in understanding the way in which oxygen and carbon dioxide are carried in the blood.

Physiology is the study of the phenomena presented by living organism. It is primarily a study of the function in the organs and the conditions which determine their function in the living animal.

To know the structure of the animal body veterinarians study Anatomy.

Veterinarians must get deep knowledge of Biological chemistry because it is the basis of clinical laboratory diagnostics and therapy.

Pharmacology is the scientific study of drugs and their use in the treatment of animal diseases and injuries.

Hygiene is the practice of keeping animals and areas clean in order to prevent illness and disease.

Veterinary and Animal husbandry are closely connected with each other. Animal husbandry includes the breeding of farm animals and their use. Farm animals are highly important sources of food for man. They are known to produce highly important products such as milk, meat and eggs. In addition, the skin of animals, down and feather of poultry and wool of sheep are used as raw materials to produce clothing and for many other purposes. The blood of animals is used in Pharmacology to obtain different drugs.

## **THE ANATOMY OF THE CAT**

Mouth. Cats have highly specialized teeth for the killing of prey and the tearing of meat: the premolar and first molar teeth. They present in canids, and are highly developed in felines. The cat's tongue has sharp spines, or papillae, useful for retaining and ripping flesh from a carcass. Cats use a variety of vocalizations for communication, including meowing, purring, hissing, growling, squeaking, chirping, clicking, and

grunting. Their types of body language: position of ears and tail, relaxation of whole body, kneading of paws, all are indicators of mood.

**Ears.** Thirty-two individual muscles in each ear allow for a manner of directional hearing: a cat can move each ear independently of the other. Because of this mobility, a cat can move its body in one direction and point its ears in another direction. Most cats have straight ears pointing upward. When angry or rightened, a cat will lay back its ears, to accompany the growling or hissing sounds it makes. Cats also turn their ears back when they are playing, or to listen to a sound coming from behind them.

**Legs.** Cats, like dogs, are digitigrades. They walk directly on their toes, with the bones of their feet making up the lower part of the visible leg. Cats are capable of walking very precisely, because like all felines they directly register; that is, they place each hind paw (almost) directly in the print of the corresponding forepaw, minimizing noise and visible tracks. This also provides sure footing for their hind paws when they navigate rough terrain.

**Claws.** Cats have protractable claws. In their normal, relaxed position the claws are sheathed with the skin and fur around the toe pads. This keeps the claws sharp by preventing wear from contact with the ground and allows the silent stalking of prey. The claws on the forefeet are typically sharper than those on the hind feet.

Most cats have five claws on their front paws, and four or five on their rear paws. However, domestic and feral are prone to polydactylyism, and may have six or seven toes. The fifth front claw is proximal to the other claws.

**Skin.** Cats possess rather loose skin; this allows them to turn and confront a predator or another cat in a fight, even when it has a grip on them. The particularly loose skin at the back of the neck is known as the scruff, and is the area by which a mother cat grips her kittens to carry them.

**Skeleton.** Cats have 7 cervical vertebrae, 13 thoracic vertebrae, 7 lumbar vertebrae, 3 sacral vertebrae, and 22 or 23 caudal vertebrae. The extra lumbar and thoracic vertebrae account for the cat's enhanced spinal mobility and flexibility, compared with humans. The caudal vertebrae form the tail, used by the cat as a counterbalance to the body during quick movements. Cats also have free-floating clavicle bones, which allow them to pass their body through any space into which they can fit their heads.

**Head.** The masseter is a great, powerful, and very thick muscle covered by a tough, shining fascia lying ventral to the zygomatic arch, which is its origin. It inserts into the posterior half of the lateral surface of the mandible. Its action is the elevation of the mandible (closing of the jaw).

The temporalis is a great mass of mandibular muscle, and is also covered by a tough and shiny fascia. It lies dorsal to the zygomatic arch and fills the temporal fossa of the skull. It arises from the side of the skull and inserts into the coronoid process of the mandible. It too, elevates the jaw.

The two main integumentary muscles of a cat are the platysma and the cutaneous maximus. The cutaneous maximus covers the dorsal region of the cat and allows it to shake its skin. The platysma covers the neck and allows the cat to stretch the skin over the pectoralis major and deltoid muscles.

**Neck and Back.** The rhomboideus is a thick, large muscle below the trapezius muscles. It extends from the vertebral border of the scapula to the mid-dorsal line. Origin, neural spines of the first four thoracic vertebrae, insertion, vertebral border of the scapula, action, draws the scapula to the dorsal.

Splenius is the most superficial of all the deep muscles. It is a thin, broad sheet of muscle underneath the clavotrapezius and deflecting it. It is crossed also by the rhomboideus capitis. Its origin is the mid-dorsal

line of the neck and fascia. The insertion is the superior nuchal line and atlas. It raises or turns the head.

Serratus ventralis is exposed by cutting the wing-like latissimus dorsi. The origin is from the first nine or ten ribs, and from part of the cervical vertebrae. The insertion is the vertebral border of the scapula. It draws scapula forward, backward and against the body.

Serratus Dorsalis is medial to both the scapula and the Serratus Ventralis. Origin, aponeurosis following the length of the mid-dorsal line, insertion, dorsal portion of the last ribs, action, draws ribs cranial.

The intercostals are a set of muscles sandwiched between the ribs. They interconnect ribs, and are therefore the primary respiratory skeletal muscles. They are divided into the external and the internal subscapularis. The origin and insertion are in the ribs. The intercostals pull the ribs backwards or forwards.

Pectoantebrachialis muscle is just one-half inch wide, and is the most superficial in the pectoral muscles. Origin, manubrium of the sternum, insertion, in a flat tendon on the fascia of the proximal end of the ulna, action, draws the arm towards the chest.

The pectoralis major, also called, pectoralis superficialis, is a broad triangular portion of the pectoralis muscle which is immediately below the pectoantebrachialis. It is actually smaller than the pectoralis minor muscle. Origin, sternum and median ventral raphe, insertion, humerus, action, draws the arm towards the chest.

The pectoralis minor muscle is larger than the pectoralis major. However, most of its anterior border is covered by the pectoralis major. Origin, ribs 3–5, insertion, coracoid process of scapula, Action, tipping of the scapula, elevation of ribs 3–5.

The most posterior, flat, thin, and long strip of pectoral muscle is the xiphi- humeralis. It is a band of parallel fibers that is not found in humans, but in felines. Its origin is the xiphoid process of the sternum, the insertion is the humerus.



Trapezius covers the back, and the neck. They pull the scapula toward the mid dorsal line, anteriorly, and posteriorly.

Clavotrapezius, the most anterior of the trapezius muscles, is also the largest. Its fibers run obliquely to the ventral surface. Origin, superior nuchal line and median dorsal line, insertion, clavicle, action, draws the clavicle dorsal and towards the head.

Acromiotrapezius is the middle trapezius muscle. It covers the dorsal and lateral surfaces of the scapula. Origin, neural spines of the cervical vertebrae, insertion, in the metacromion process and fascia of clavotrapezius, action, draws the scapula to the dorsal, and holds the two scapulas together.

Spinotrapezius, also called thoracic trapezius, is the most posterior of the three. It is triangular shaped. Origin, neural spines of the thoracic vertebra, insertion, scapular fascia, action, draws the scapula to the dorsal and caudal regions.

## **THE ANATOMY OF THE DOG**

External anatomy is concerned with the study of such organs as muzzle, dewlap (throat, neck skin), shoulder, elbow, forefeet, croup, leg (thigh and hip), hock, hind feet, withers, stifle, paws, tail.

Physical characteristics. Like most predatory mammals, the dog has powerful muscles, a cardiovascular system that supports both sprinting and endurance, and teeth for catching, holding, and tearing.

The dog's ancestral skeleton provides the ability to run and leap. Their legs are designed to propel them forward rapidly, leaping as necessary, to chase and overcome prey. Consequently, they have small, tight feet, walking on their toes; their rear legs are fairly rigid and sturdy; the front legs are loose and flexible, with only muscle attaching them to the torso.

Dogs have disconnected shoulder bones that allow a greater stride length for running and leaping. They walk on four toes, front and back, and have vestigial dewclaws (dog thumbs) on their front legs and sometimes on their rear legs.

**Sight.** Like most mammals, dogs are dichromats and have color vision equivalent to red-green color blindness in humans. Different breeds of dogs have different eye shapes and dimensions, and they also have different retina configurations. Dogs with long noses have a “visual streak” which runs across the width of the retina and gives them a very wide field of excellent vision, while those with short noses have an “area centralis” – a central patch with up to three times the density of nerve endings as the visual streak – giving them detailed sight much more like a human's.

Some breeds have a field of vision up to 270°, although broad-headed breeds with short noses have a much narrower field of vision, as low as 180°.

**Hearing.** The frequency range of dog hearing is approximately 40 Hz to 60,000 Hz. Dogs detect sounds as low as the 16 to 20 Hz frequency range and above 45 kHz, and in addition have a degree of ear mobility that helps them to rapidly pinpoint the exact location of a sound. Eighteen or more muscles can tilt, rotate and raise or lower a dog's ear. Additionally, a dog can identify a sound's location much faster than a human can, as well as hear sounds up to four times the distance that humans are able to.

**Smell.** Dogs have nearly 220 million smell-sensitive cells over an area about the size of a pocket handkerchief. Dogs can sense odours at concentrations nearly 100 million times lower than humans can. The percentage of the dog's brain that is devoted to analyzing smells is actually 40 times larger than that of a human. Some dog breeds have been selectively bred for excellence in detecting scents, even compared to their canine brethren.

Modern dog breeds exhibit a diverse array of fur coats, including dogs without fur. Dog coats vary in texture, color, and markings, and a specialized vocabulary has evolved to describe each characteristic.

Tail. There are many different shapes for dog tails: straight, straight up, sickle, curled, cork-screw. In some breeds, the tail is traditionally docked to avoid injuries. It can happen that some puppies are born with a short tail or no tail in some breeds.

## **THE ANATOMY OF THE CATTLE**

Cattle are raised as livestock for meat (beef and veal), as dairy animals for milk and other dairy products, and as draft animals (pulling carts, plows and the like). Other products include leather and dung for manure or fuel. In some countries such, as India, cattle are sacred. It is estimated that there are 1.3 billion cattle in the world today.

Cattle have one stomach with four compartments. They are rumen, reticulum, omasum, and abomasum, with the rumen being the largest compartment. The reticulum, the smallest compartment, is known as the “honey comb”. Cattle sometimes consume metal objects which are deposited in the reticulum and irritation from the metal objects causing hardware disease. The omasum’s main function is to absorb water and nutrients from the digestible feed. The omasum is known as the “many plies”. The abomasum is like the human stomach; this is why it is known as the “true stomach”.

Cattle are ruminants. They have a digestive system that allows use of otherwise indigestible foods by repeatedly regurgitating and rechewing them as “cud”. The cud is then reswallowed and further digested by specialized microorganism in the rumen. These microbes are primarily responsible for decomposing cellulose and other carbohydrates into volatile fatty acids that cattle use as their primary metabolic fuel. The microbes inside the rumen are also able to synthesize amino acids from nonprotein nitrogenous sources, such as urea and ammonia. As these microbes reproduce in the rumen, older generations die and their carcasses continue on through the digestive

tract. These carcasses are then partially digested by the cattle, allowing them to gain a high quality protein source. These features allow cattle to thrive on grasses and other vegetation. The gestation period for a cow is nine months. A newborn calf weighs 25–45 kg (55 to 99 lb). Breeding stock usually lives to about 15 years (occasionally as much as 25 years).

## CHOCOLATE

Chocolate comprises a number of raw and processed foods that are produced from the seed of the tropical cacao tree. Native to lowland, tropical South America, cacao has been cultivated for at least three millennia in Central America and Mexico, with its earliest documented use around 1100 BC/ the majority of the Mesoamerican peoples made chocolate beverages, including the Maya and Aztecs, who made it into a beverage known as xocolatl, a Nahuatl word meaning «bitter water». The seeds of the cacao tree have an intense bitter taste, and must be fermented to develop the flavor.

After fermentation, the beans are dried, cleaned, roasted and the shell is removed to produce cacao nibs. The nibs are then ground and liquified, resulting in pure chocolate in fluid form: chocolate liquor. The liquor can be further processed into two components: cocoa solids and cocoa butter. Pure, unsweetened chocolate contains primarily cocoa solids and cocoa butter in varying proportions. Much of the chocolate consumed today is in the form of sweet chocolate, combining chocolate with sugar. Milk chocolate is sweet chocolate that additionally contains milk powder or condensed milk. «White chocolate» contains cocoa butter, sugar and milk, but no cocoa solids (and thus does not qualify to be considered true chocolate).

Chocolate contains alkaloids such as theobromine and phenethylamine, which have physiological effects on the body. It has been linked to serotonin levels in the brain. Scientists claim that

chocolate, eaten in moderation, can lower blood pressure. Dark chocolate has recently been promoted for its health benefits, including a substantial amount of antioxidants that reduce the formation of free radicals, though the presence of theobromine renders it toxic to some animals, such as dogs and cats.

Chocolate has become one of the most popular flavors in the world. Gifts of chocolate molded into different shapes have become traditional on certain holidays: chocolate bunnies and eggs are popular on Easter, chocolate coins on Hanukkah, Santa Claus and other holiday symbols on Christmas, and hearts on Valentine's Day. Chocolate is also used in cold and hot beverages, to produce chocolate milk and hot chocolate.

## **HISTORY OF YOGURT**

There is evidence of cultured milk products being produced as food for at least 4,500 years. The earliest yoghurts were probably spontaneously fermented by wild bacteria living on the goat skin bags carried by nomadic people. Today, many different countries claim yoghurt as their own invention, yet there is no clear evidence as to where it was first discovered, and it may have been independently discovered several times.

The use of yoghurt by mediaeval Turks is recorded in the books *Diwan Lughat al-Turk* by Mahmud Kashgari and *Kutadgu Bilig* by Yusuf Has Hajib written in the eleventh century. In both texts the word "yoghurt" is mentioned in different sections and its use by nomadic Turks is described. The first account of a European encounter with yoghurt occurs in French clinical history: Francis I suffered from a severe diarrhea which no French doctor could cure. His ally Suleiman the Magnificent sent a doctor, who allegedly cured the patient with yoghurt.

Tarator is a soup made of yoghurt popular in the Balkans. Until the 1900s, yoghurt was a staple in diets of the South Asian, Central Asian, Western Asian, South Eastern European and Central European regions. The Russian biologist Ilya Ilyich Mechnikov had an unproven hypothesis that regular consumption of yoghurt was responsible for the unusually long lifespans of Bulgarian peasants. Believing *Lactobacillus* to be essential for good health, Mechnikov worked to popularise yoghurt as a foodstuff throughout Europe. A Sephardic Jewish entrepreneur named Isaac Carasso industrialized the production of yoghurt. In 1919, Carasso, who was from Salonika, started a small yoghurt business in Barcelona and named the business Danone ("little Daniel") after his son. The brand later expanded to the United States under an Americanized version of the name: Dannon. Yoghurt with added fruit jam was invented to protect yoghurt from decay. It was patented in 1933 by the Radlicka Mlekarna dairy in Prague, and introduced to the United States in 1947, by Dannon.

Yoghurt was first introduced to the United States by Armenian immigrants Sarkis and Rose Colombosian, who started "Colombo and Sons Creamery" in Andover, Massachusetts in 1929. Colombo Yogurt was originally delivered around New England in a horse-drawn wagon inscribed with the Armenian word "madzoon" which was later changed to "yogurt", the Turkish name of the product, as Turkish was the lingua franca between immigrants of the various Near Eastern ethnicities who were the main consumers at that time. Yoghurt's popularity in the United States was enhanced in the 1950s and 60's when it was presented as a health food. By the late 20th century yoghurt had become a common American food item and Colombo Yogurt was sold to General Mills in 1993.

## **FOOD PRESERVATION (I)**

Food spoilage is due to the growth of microorganisms in the food. In the course of their development these produce, in some cases,

harmless products, such as lactic acid in sour milk or carbon dioxide and alcohol in bread dough made with yeast; in others harmless but undesirable products, such as the flavour which mold imparts to bread; while, in still other cases, harmful toxins are produced. Food preservation has both hygienic and economic aspects. From the point of view hygiene, food is preserved in order to prevent the formation of products which are harmful to the body.

Many essential foods are preserved for the purpose of prolonging the period of availability. Green vegetables as well as the more stable root vegetables can be fresh or kept in cans at any time. Due to improved methods of food preservation, it is now possible for everyone at all times to have clean, wholesome food a well-balanced diet. Thus any food is subject to either decay or spoilage by the growth of microorganisms. There are three classes molds, yeasts, and bacteria. All are characterized by their extremely minute size and their wide distribution.

Molds. The conditions for the growth of mold are less rigid than for any other class of microorganisms. For this reason we may find well-established settlements of molds on almost any substances: they are found on acid foods, such as lemons, oranges or tomatoes; on neutral foods, such as bread and meats; on sweets such as jellies and jams; and on salty food such as bacon or ham.

Most molds are spore bearing. Spores are clearly visible as the coloured specks which fringe the thread-like mold growth. The colour will vary with the kind of mold. The more common mold has bluish-green spores, but others with black or red spores are seen fairly often. Molds multiply most rapidly at temperatures varying from 20 to 35°C, and in damp, dark places in which there is little circulation of air. Molds may be destroyed or their growth checked by unfavourable conditions.

Low temperatures retard the growth of mold, but temperatures below that of an ordinary ice chest (10to15°C) are necessary. Molds must

have some moisture. A dry food will not mold unless it is kept in a damp place.

Molds will form in darkness or light, but many species cease to grow if exposed to bright sunlight. Circulating air is destructive to mold growth.

Yeasts. - Yeasts, unlike molds, will grow only on foods containing sugars. The reaction called fermentation changes the sugar to alcohol and carbon dioxide with minute quantities of other products. Although yeasts will grow only in the presence of sugar, they may be found widely distributed.

The mixture of various kinds of yeasts present everywhere in the air is called wild yeast. Yeasts multiply either by spores or by cell division. Among the essentials for the growth of yeasts are sugar, oxygen, water and certain inorganic salts such as those of calcium, nitrogen, and sulphur. They are easily destroyed, by high temperatures (100°C). The alcohol which they produce in their life processes slows down and, finally, completely checks further growth. For this reason beverages of high alcoholic content can be obtained only by distillation.

All fruit juices are subject to fermentation, unless the yeasts which they naturally contain are destroyed, which may easily be done by bringing the juices to boiling temperatures and sealing in clean containers while hot.

Bacteria. Although there are many properties which are characteristic of all bacteria, the differences in the behavior of the different kinds of bacteria are greater than those of the different kinds of yeasts and molds. Bacteria are widely distributed. Like yeasts and molds, they may be found anywhere in the air, water, soil, and in all foods. In a less acid medium they multiply most rapidly, and, therefore, it is the less acid foods which are most subject to bacterial decomposition. The products of decomposition vary with the kind of food and the kind of bacteria. While in most cases we wish to decrease the bacteria content, certain foods are made desirable by products of bacteria growth. Sauerkraut



owes its flavour and physiological effects to the lactic acid which is produced by the microorganisms in the course of its preparation. The flavours of cheeses, butter, and butter substitutes are also products of bacterial activity. On the other hand, the spoilage of canned foods, meats, milks and vegetables is also due to the products of bacterial growth.

Bacteria require moisture for growth. Exposure to sunlight for sufficient length of time destroys bacteria but not their spores. The temperature for optimum growth will vary (20 to 55°C) with the kind of bacteria. Bacteria are more difficult to destroy than the other microorganisms.

## **FOOD PRESERVATION (II)**

The methods of food preservation may give temporary preservation by checking the growth of microorganisms or permanent preservation by destroying them.

Refrigeration or cold storage is the most common method of temporarily preserving food. Indeed, it is one of the most satisfactory of all methods of food preservation, as it does not markedly alter either the taste, appearance, or nutritive value of the food. Refrigeration is practised in the home and commercially. It is most successful with the foods which are least subject to bacterial decomposition, but other foods may be preserved a long time if freezing temperatures are used. Fish and animal products can be kept only by refrigeration at very low temperature. Considerable success is now being experienced in the preserving of fish and meat and of many fruits and vegetables by freezing. New methods of freezing and better storage facilities for frozen products have improved the flavour and texture of the food so treated.

The electric refrigerators are somewhat colder and contain drier air and are, therefore, more successful for the preservation of foods which are subject to bacterial growth.

Other methods of food preservation are effective over a long period of time. By these methods either the microorganisms are destroyed, or the conditions are made unsuitable for their growth. There is a variety of methods for this more permanent type of food preservation.

**Drying.** Drying has been a means of food preservation for centuries and is still used for many foods. It promotes preservation by re-moving the water essential for the growth of all microorganisms. We find in the market dried fruits, milks, meats, and vegetables, but the varieties of each are few.

The method of drying varies greatly with the food. Foods containing sugar require less drying than others.

Dried foods occupy less storage space and may be stored without consideration of temperature. Most dried foods require soaking before cooking in order to restore the water lost by drying. The dried foods most commonly used are prunes, raisins, currants, apples, apricots, peaches, figs, dates, beans, fish, beef, and mushrooms.

**Canning.** Canning is the most common form of food preservation. Preservation is insured by the use of sufficient heat to destroy all microorganisms which might develop in the canned product during storage. The temperature in the canning of food depends upon several factors. It has already been stated that bacteria and their spores become less resistant to heat as the hydrogen-ion concentration of the media increases. In canning, boiling temperature 100°C is considered low, 115 to 119°C high. It may be noted that foods of high acid concentration require either less time, or lower temperature, or both, than the less acid foods.

Experiments have shown that the rate of heat penetration is governed by a number of factors, some of which are more predictable than others. It goes without saying that the food in the centre of a glass jar will take longer to reach sterilization temperature than that in a tin, can, that large-size containers require a longer time than small, that food

which is processed at 115°C reaches 100°C sooner than that processed at 100°C, and that a jar of cold food requires a longer period than one of preheated food.

**Storage of Canned Food.** While every effort is made to destroy the microorganisms of the food during the processing, it should be remembered that if any spores resist the temperature of the cooker, then development will be hindered by storing the canned food at low temperatures. Low temperatures are also unfavourable to the reactions which take place between the food and the tin or iron. It has been shown that the natural colour of fruits is preserved much better by storing fruits in a warehouse at 0°C, than at higher temperatures, no discolouration being observable after two and a half years of storage. It is recommended, therefore, that canned food which is not to be used within a very short time should be stored at temperatures as near 0°C as possible.

Many labels on canned foods do show a grade for the product. Definitions of these grades are given as follows: the fancy grades use uniformly perfect fruit in the best state of ripeness and of the largest size. Cans of choice grade fruit contain nearly perfect fruit of average size in a medium syrup.

In addition to these, there are two lower grades which are used largely for cooking.

## **DRIED AND PRESERVED FRUITS**

Preserved fruits are now numerous, but not every kind of fruit is suitable for preservation. Some fruits, of course, are preferred in their natural state, while others are preferable and sometimes only procurable, in a preserved condition.

As most fruits are seasonable, it follows that those demanding them out of season must accept them in a preserved form. There are at least three different methods of preserving fruits: (1) by desiccation (drying); (2) by utilization of cold air; (3) by the use of chemicals. Some fruits, of course, are preferred in their natural state, while others are preferable and in a preserved condition 1.

Currants are the most common of all dried fruits consumed by the human family. They are the products of the vine, just as raisins, as every school boy knows, are grapes in a dried condition. Not all varieties of grapes, however, are suitable for drying. The grapes destined to be converted into raisins are invariably dried on the vines, after semi-cutting, or on the ground after the manner of currant-drying. The drying process takes some days to complete, after which the fruit is put into boxes holding about 150 lb. to be transported to the packing houses.

Machines, called "stemmers" are brought into use for removing the stems. Again the fruit is graded and passed to a "seeder", which flattens raisins and brings the seeds to the surface, while another piece of mechanism, a teeth-like roller, removes the seeds.

Plums destined for the leading grades of prunes are gathered by hand, laid in shallow utensils, and then placed in a cool and dry building to soften. Afterwards they are put into spent ovens for about twenty-four hours, a procedure which is repeated until the fruit is of the requisite dryness. Later comes the cooling process and the final packing into cans, jars, boxes, or whatever receptacle is considered most suitable for the various markets. The drying process naturally calls for the exercise of care and skill, so that the fruit may not be deprived of its original flavour and fruity consistency.

Citron peel and lemon peel are consumed in large quantities by the people of Europe and America. There is difference in colour and thickness between the two commodities. The lemon peel is candied; otherwise the process of preserving is similar to that applied to the citron.

Crystallized fruits are now a very popular dessert, or confectionary, and they are made in many European countries. The fruits are made extracting the juice from the raw product and replacing it with sugar syrup. The hardening of the syrup preserves the fruit, and as the latter is solidified its natural form is retained.

Several methods of crystallizing are in vogue, but that in general practice is the boiling of the fruit for a certain length of time, after which it is suspended in syrup until saturated.

In due course it is removed from the syrup process and placed in drying ovens, or drying rooms, at a high temperature until crystallized. In some countries the drying is done in the open air upon trays.

## **EGGS AND EGG COOKERY**

Eggs are indispensable in the average diet. They contain in colloidal form many of the more important but less abundant food materials, vitamins and minerals, along with fat and protein, and are an easily digestible, easily prepared, nutritious, and concentrated food in themselves, as well as being most important in the preparation of many other foods because of their colloidal nature.

There are great differences in eggs which may be attributed to many causes: the feeding and care of the hens, the kind of hen, and the care of the eggs after they are laid.

The consumer has little or no way to judge the quality of an egg from its external appearance. Difference in size does not indicate difference in quality. The colour of the shell is of little significance. A clean-shelled egg indicates a clean hennery and, therefore, an egg of better keeping qualities and flavour than those with dirty shells. An egg shell with a chalky appearance is usually fairly fresh. A shiny smooth shell indicates an old egg.

Changes in eggs on keeping. The shell of freshly laid egg is completely filled, the yolk spherical in shape, and the white thick and gelatinous. The new-laid egg contains no bacteria which promote spoilage. It may contain drops of blood or bits of extraneous matter. This occurs very seldom, but even when the hens have the best care it is not entirely eliminated. Soon after the egg is laid, evaporation of the water with the dissolved carbon dioxide takes place through the porous shell. As these gases leave the shell, air containing microorganisms enters. At the same time, some of the water passes from the white to the yolk, and the whites begin to lose their gelatinous consistency and become thinner. The exact cause of this liquefaction of gelatinous egg white is not known.

The change may be physical or chemical. It has been proved that thin whites may be used satisfactorily in cakes, omelets, and souffles. In other words, the whipping qualities of the egg whites has not been appreciably impaired by the physical change of gelatinous to watery egg whites.

Other changes in the egg occur as the egg ages. The membrane which surrounds the yolk becomes stretched and weakened by increasing amount of water. The yolk no longer appears spherical but flattens out when the egg is broken into a dish; sometimes the stretched membrane around the yolk will be broken on cracking the egg. It is always difficult to separate the yolk and white of an old egg without breaking the yolk.

The change in the location of the water appears to be due to the changing hydrogenion concentration of the egg through loss of carbon dioxide.

Freshly laid eggs put in storage in an atmosphere of carbon dioxide in a concentration sufficient to prevent this change in the carbon dioxide content of the egg do not show these changes so markedly.

The enlargement of the air space is due to the evaporation of moisture from the egg, but as the loss of water depends on the relative

humidity of the storage space the size of the air space is not positive indication of either the age of the egg or its quality.