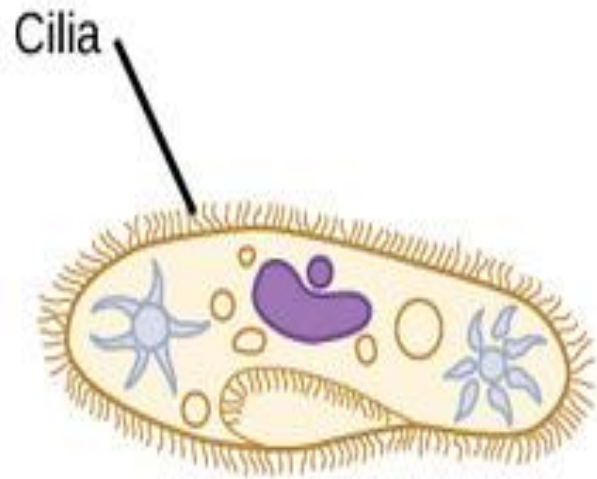
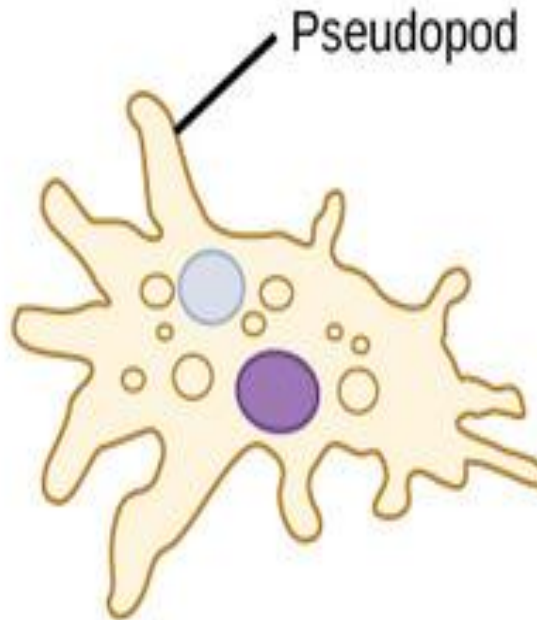


Paramecium



(a)

Amoeba



(b)

Euglena



(c)

PROTISTS

Kingdom: *Protista*

Example: *Amoeba*

INTRODUCTION of *Protista*

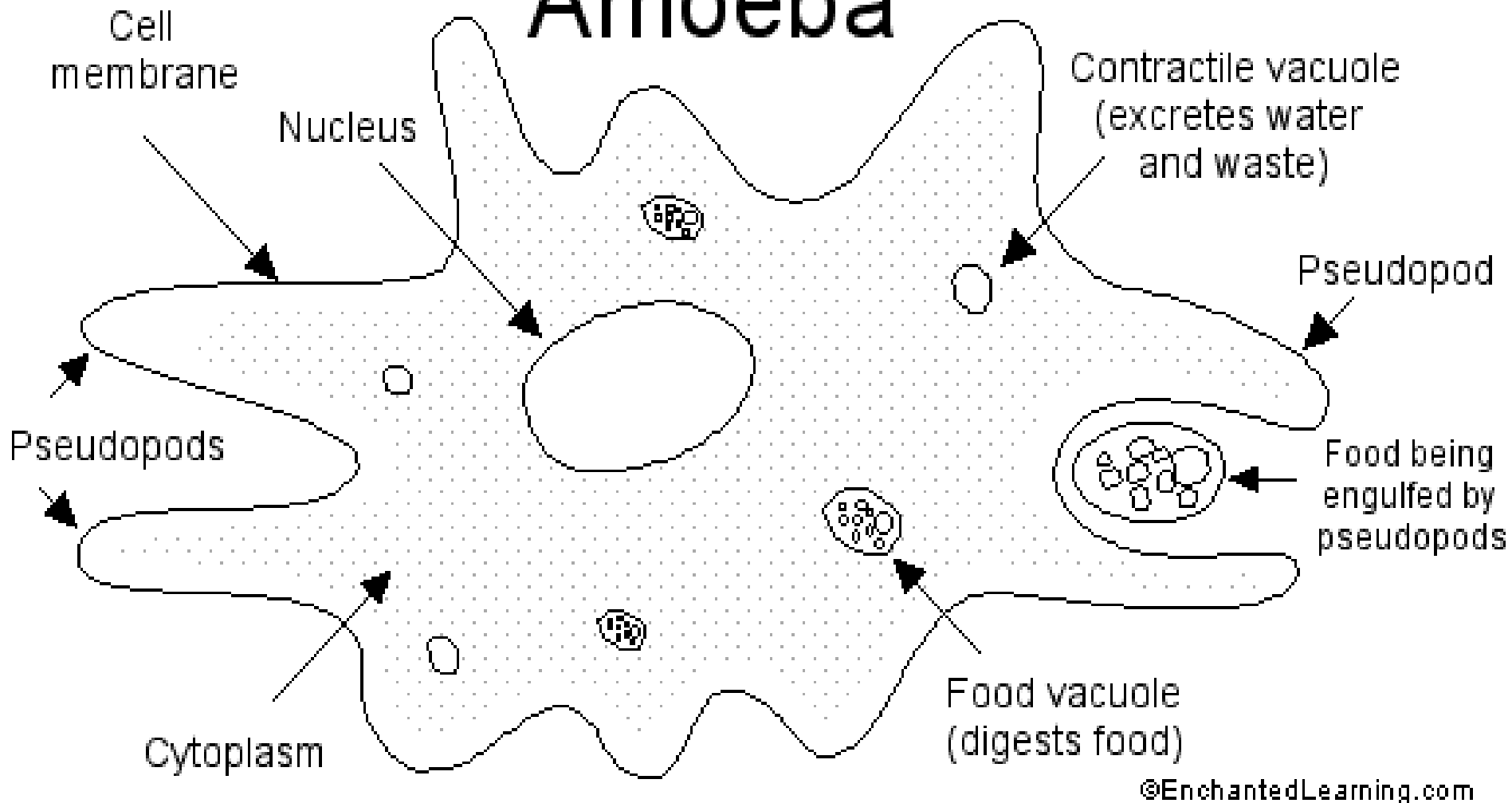


- Some are UniCellular; some are MultiCellular.
- ***Protozoa*** sub-group includes *Amoeba*.
- *Algae* is an autotrophic sub-group.
- *Slime moulds* are **not** fungus – are heterotrophic.

OUR STUDY:

- ***Protozoans:*** eukaryotic, unicellular, aquatic, reproduce asexually.
- They move using cilia, flagella, or PseudoPodia.

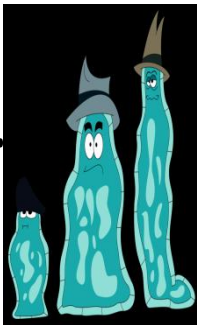
Amoeba



STRUCTURE OF AMOEBA ***(ASYMMETRICAL)***

STRUCTURAL PARTS of *AMOEBA*

- Nucleus – carries full genetic plan, and controls cell.
- Membrane – surrounds the cell; allows diffusion.
- EctoPlasm – hard jelly (inside the membrane).
- EndoPlasm – soft (cytoplasmic) jelly, within the insides of the cell.
- PseudoPodia – bulges from squirted cytoplasm.
- Contractile vacuole – acts like a bladder, for water.
- Food vacuole – surrounds an item of food.
- Lysosome – has digestive enzymes for the food.



CHARACTERISTICS of *PROTISTS*

- Eukaryotic = have membranes around organelles.
- Simple cells – **UniCellular** or **MultiCellular**. Some are **Colonial** because they hang around in groups.
- Phyto**Plankton** (ocean) = UniCellular Algae.
- Some Protists are **Pathogenic** = cause diseases.
- Reproduction is mostly through Asexual Mitosis – the process of **Binary Fission**.
- (If conditions are not good, they can stay **dormant** as resistant zygosporoes until conditions improve – then they will reproduce.)

DISEASE: MALARIA

- Cause: **Protozoan**, called *Plasmodium*.
- Vector: Female *Anopheles* mosquito.

Process:

- Proboscis pierces the human's skin.
- Blood-thinners are injected into the blood.
- *Plasmodium* parasite goes in with it.
- It goes to the liver, then the blood. It takes over cells of red blood corpuscles to make more *Plasmodiums*.
- Female *Anopheles* mosquitoes suck this infected blood, and go out to spread the disease further.

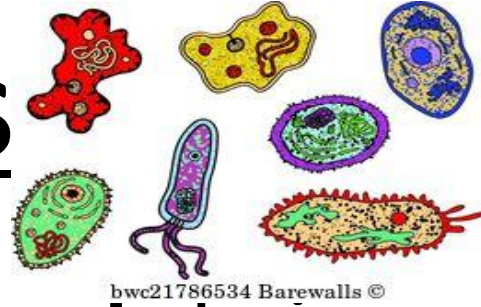


MORE DETAILS of MALARIA

- **Symptoms**: Fever, head-ache, sweating, nausea, vomiting – feels like really bad ‘flu.
 - **Treatment**: Go to a doctor– they can cure it.
 - **Prevention**: Aim to reduce mosquito contact:
Kill the mosquitoes; Stop them from breeding; Stop them from biting you.
- If you go into a high-risk Malaria-Area, take anti-malaria medication **before** going into it.



BIOLOGICAL IMPORTANCES



- AutoTrophs – start many aquatic **food** chains.
- Their PhotoSynthesis also helps the air's **gas balance**.
- Useful seaweeds – **solidify** ice creams, jellies.
- SaproPhytes – **decompose** organic matter from dead plants and animals.
- Pathogens cause **diseases** in plants and animals.
- Some produce silica, used to make **glass**.

QUESTIONS Page 7

Question 1

15 X [1] = [15]

- | | | |
|--------------------|------------------------|-------------------|
| 1. Asymmetry | 2. PseudoPodia | 3. Plasma |
| membrane | 4. EndoPlasm | 5. Lysosome |
| 6. Food Vacuole | 7. Contractile Vacuole | 8. Eukaryote |
| 9. PhagoCytosis | 10. Algae | 11. Slime mould |
| 12. OsmoRegulation | 13. Egestion | 14. IntraCellular |
| 15. Binary Fission | | |

Question 2

8 X [2] = [16]

- | | | | | | | |
|------|------|------|------|------|------|------|
| 1. C | 2. D | 3. B | 4. A | 5. C | 6. B | 7. B |
| 8. A | | | | | | |

Question 3

- | | |
|---------------------|--------------|
| 1. Plasma membrane | Food Vacuole |
| Lysosome | Nucleus |
| PseudoPodium | EndoPlasm |
| Contractile Vacuole | EctoPlasm |



[8]

2. A: Protection / Controlling entry and exit of things[2]
B: Water control (OsmoRegulation) [2]
C: Stores food for digestion [2]
D: Has plan of cell / controls activities of cell [2]

Question 4

1. Plasmodium 2. Female *Anopheles* Mosquito
3. Anti-Coagulant 4. Liver 5. Asexual 6. Red
Blood Corpuscle 7. Bursts and releases parasites
into blood 8. Inside the mosquito 8 X [1] = [8]
9. Fever. HeadAches. Sweating. Flu symptoms. Nausea
and vomiting. [4]

10. Yes [1]

11. Yes [1]



12. Take malaria medication before going to malaria area. Kill mosquitoes with insecticides. Keep away from mosquitoes – mosquito nets on beds, insect screen on windows. Stop mosquitoes breeding – treat water lying around in malaria area. [5]

13. AutoTrophs in water to produce food. Maintains balance in gases. SeaWeeds to thicken foods like ice-creams. Decomposition and recycling of nutrients. Silica in some to make glass. Diseases.[4]



Fungus can often cause discoloration



Fungus can spread to the fingernail



Mild case of toenail fungus



Fungus can cause the toenail to raise from the bed of the nail

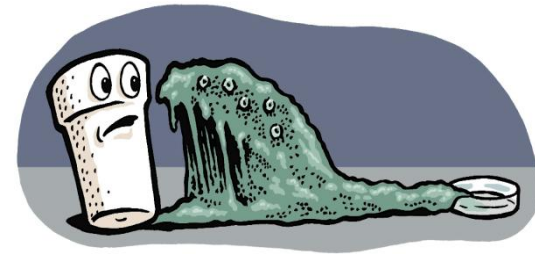
FUNGI

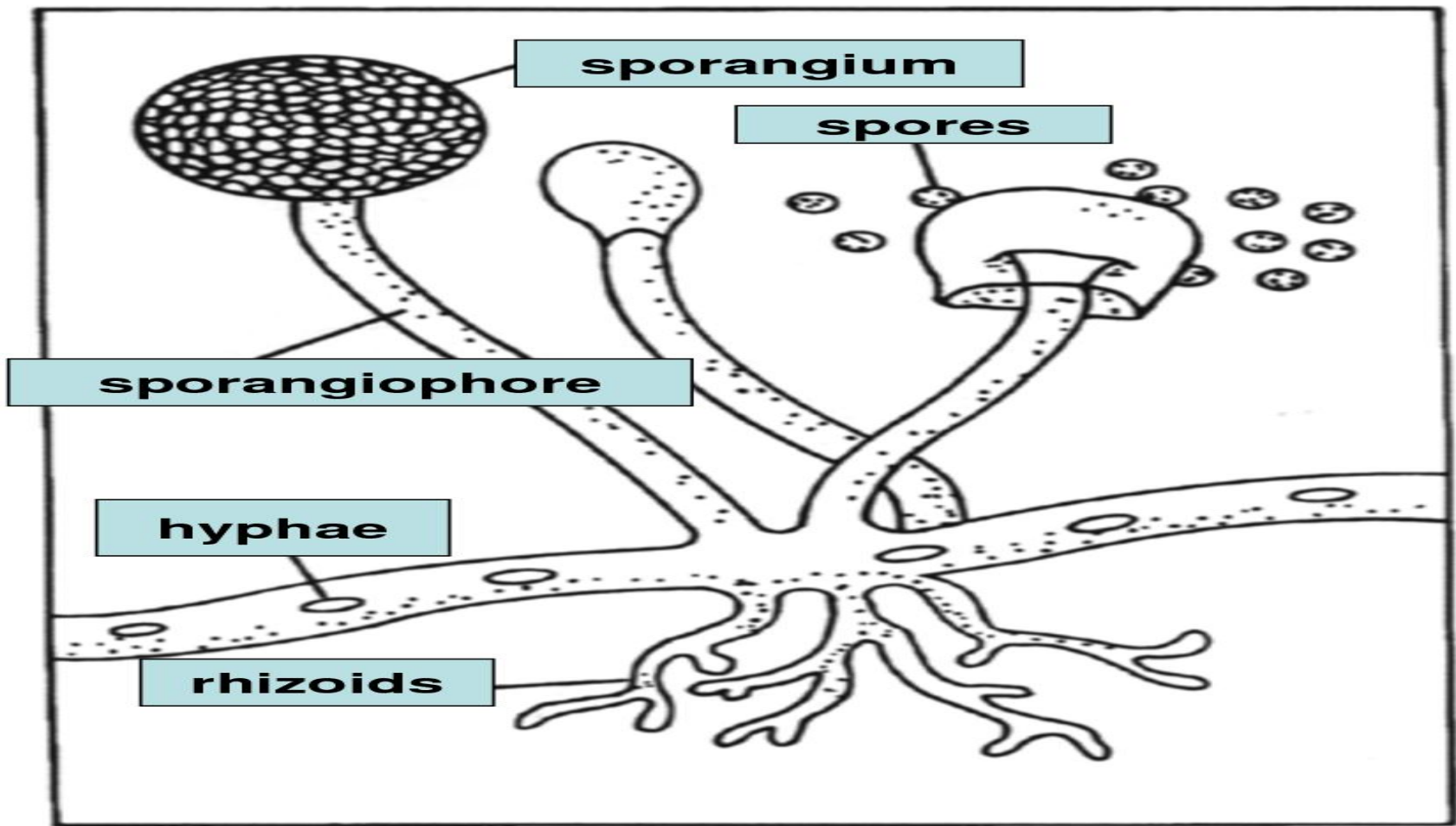
EXAMPLE: RHIZOPUS
(BREAD MOULD)



INTRODUCTION

- **All** *Fungi* are HeteroTrophic – they do **not** make their own food.
- Most are saprophytic decomposers.
- Some are pathogenic parasite (like Ringworm).
- Most are MultiCellular.
- Some are UniCellular (like the yeast).
- **Examples:** Bread moulds, *Penicillium*, Toad-stools, Mushrooms, “Rusts” (on some plant leaves).
- (See page 10 for pictures.)





STRUCTURE OF *RHIZOPUS* BREAD MOULD

Horizontal Hyphae are Stolons, to connect each other.

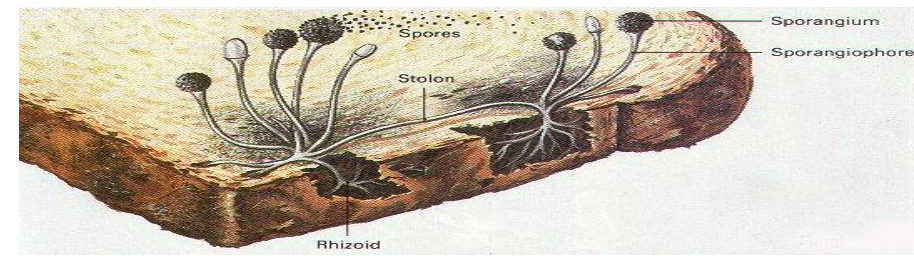
Hyphae that penetrate the bread are called Rhizoids, for food.

Vertical hyphae are Sporangiophores, carrying reproductive spores.

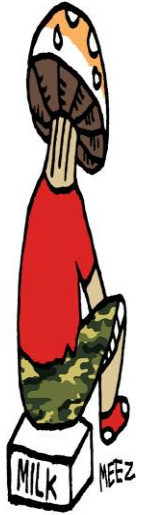
STRUCTURE of *RHIZOPUS* – DETAILS

See Diagram, p. 11

- **Thallus** – roots, stems and leaves are not real.
- **Hyphae** – tiny tubes: Aseptate (no cross-walls). MultiNucleate. Mass together in a **Mycelium**.
- **Stolons**: these are horizontal hyphae.
- **Rhizoids**: hyphae that grow down, into the bread.
- **SporangioPhores**: hyphae that grow up vertically, and support the **sporangium** (which produce **spores** for asexual reproduction).



CHARACTERISTICS of *FUNGI*



- **Eukaryotic** – have membranes around organs.
- Hyphae walls are made of **fungal chitin**.
- **Most** hyphae have cross-walls (**septa**).
- The **saprophytes** (like *Rhizopus* Bread Mould) release digestive enzymes, which digest the food (like bread, or organic matter). This food can then be absorbed by the *Fungus*.
- Some **Animal Diseases**: *Candidiasis* (Thrush), Athlete's Foot, Ringworm. (See page 12.)
- Some **Plant Diseases**: Smuts, Downy Mildew.

DISEASES: PLANT RUSTS



- **Symptoms**: The *fungus* attaches onto the leaves, where it grows and spreads, to look like rust.
- **Cause**: The rust stays dormant on surrounding plants that have become its primary host over winter. In spring, it develops spores that are blown to infect their secondary hosts (crops – including wheat). *See Page 13.*
- **Management**: mow/cut, fertilise, and irrigate properly. Burn infected leaves. Spray fungicides.
- **Prevention**: plant clean seed, sterilise tools used.

BIOLOGICAL IMPORTANCE of *FUNGI*

- **Decomposers** – SaproPhytes break down organic matter to re-cycle nutrients.
- **Economics** – Mushrooms are sold and eaten. Some cheese is made with *Penicillium*. Yeast is used to make bread, beer, wine. Losses of crops can result from diseases or moulds.
- **Medicine** – Penicillin is an AntiBiotic made from *Penicillium notatum*, used to fight many infections.

See Page 15 for this story.



QUESTIONS Page 11

Question 1

15 X [1] = [15]

- | | | |
|-------------------|-------------|------------------------|
| 1. SaproPhytes | 2. Pathogen | 3. Thallus |
| 4. Mycelium | 5. Hyphae | 6. SporangioPhore |
| 7. Stolon | 8. Rhizoid | 9. Aseptate |
| 10. Sporangium | | 11. Substrate |
| 12. MultiNucleate | 13. Rusts | 14. <i>Penicillium</i> |
| 15. Athletes Foot | | |

Question 2

5 X [2] = [10]

- | | | | | |
|------|------|------|------|------|
| 1. C | 2. D | 3. A | 4. C | 5. C |
|------|------|------|------|------|

Question 3

1. Columella

Spores

Sporangium

SporangioPhore

Stolon

Rhizoid



[6]

2. A: Germinates into new structures.

[2]

B: Holds sporangium up for better spore distribution.

[2]

C: Anchors. Squirts out digestive enzymes. Sucks up food.

[2]

Question 4

1. Fungal infection

[1]

2. *Candida*

[1]

3. Anti-fungal mouthwash or medication

[2]

4. Clean dry skin. AntiBiotics from doctor. Eat properly. Exercise properly. Diabetics keep sugar levels right.

[3]

5. RingWorm. Athlete's Foot.

[2]



Question 5

1. SaproPhytes, so decomposers. Recycle nutrients to be used by other organisms. [3]
2. Mushroom foods. Making cheese. Yeasts for breads, cakes, etc. Make beers and sparkling wines with CO₂. Make wines – release CO₂. [5]
3. AntiBiotics (like Penicillin) are used to fight many different infections. [3]

