Blood Safety

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Brought to you by Project V

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Table of Contents

Preface

Blood is the vital essence that runs through us all, by this simple fact it is what binds us. Understanding the very thing that keeps us alive is essential to your well being as well for others. Blood is as neutral as it comes, it's not only the symbol of life but death as well. We hope you find this informational document handy for your needs, in no way shape or form do we claim to be licensed medical professionals giving advice.

Understanding Blood

First we need to know what is the definition of blood, blood is a bodily fluid that has 4 main components in which all have a function for your living needs.

- **Red Blood Cells (RBCs):** Red blood cells make up the majority of the components in your blood, That is why your blood is red because of the influx of red blood cells in your bloodstream. These cells have a special protein called hemoglobin, which transports oxygen from the lungs to the rest of the body and brings carbon dioxide back to the lungs for exhalation.

- **White Blood Cells (WBCs):** These cells are crucial for the immune system, defending the body against infection and foreign invaders. The most common type of white blood cell is actually known as the neutrophil. Although they only live less than a day the body has to produce enough.

- **Platelets:** Are only a fraction of a cell, These help with blood clotting, preventing excessive bleeding when injuries occur. Platelets move to the injured location of the body and latch to the injured blood vessel and clots in that location to cover the wound and prevent further leakage.

- **Plasma:** The liquid portion of blood, which contains water, electrolytes, proteins, hormones, and waste products. When syphoned it looks yellow.

Blood Disorders and Conditions

- **Anemia:** A condition characterized by low levels of red blood cells or hemoglobin, leading to fatigue, weakness, and pale skin. Anemia is considered a very common condition, affecting roughly one-third of the global population.

- **Hemophilia:** A genetic disorder where the blood doesn't clot properly, leading to excessive bleeding from injuries. More than 200,000 people worldwide have hemophilia, but the actual number could be over 1.1 million due to underdiagnosis.

- **Leukemia and other Blood Cancers:** Cancers such as Leukemia, lymphoma, and myeloma that affect white blood cells, impairing the immune system and causing uncontrolled cell growth. Blood cancers account for 6% of all cancers worldwide.

- **Sickle Cell Disease:** A genetic disorder where red blood cells become misshapen, leading to pain and possible organ damage. 5% of the world's population carries the trait genes for hemoglobin disorders, including SCD.

Maintaining Blood Health:

- **Balanced Diet:** A diet rich in iron, vitamins (especially B12 and folic acid), and other essential nutrients supports healthy blood cell production.
- **Regular Exercise:** Physical activity can improve circulation and stimulate red blood cell production.
- **Hydration:** Proper fluid intake ensures the blood remains well-balanced and fluid.
- **Avoiding Smoking and Excessive Alcohol:** Both can affect blood cell production and overall health.
- **Routine Checkups:** Regular health exams can help detect blood-related issues early.

Blood Donation

Blood donation in the medical field is considered a life saving procedure, while in the vampyre community that is more so debated on. There are many safety procedures that are put in place to protect both practitioner and donor. If you are interested in donating blood via a medical facility or in other safe means we will break down the various donations that you may find.

- **Whole Blood Donation:** The collection of all blood components.
- **Platelet Donation:** A process called apheresis where platelets are separated from other blood components and donated.
- **Plasma Donation:** The collection of only the plasma portion.

Eligibility for Blood Donation:

- Be in good health and feeling well
- Be between 17 and 65 years old (varies by country and organization).
- Weigh at least 110 pounds (50 kg).
- Have no recent history of certain infections or diseases, such as HIV, hepatitis, or malaria.
- Cannot be pregnant or have been pregnant in the past 3 months.
- Wait a specific period between donations, depending on the donation type is how long you have to wait before you can donate again.

Blood Collection and Screening

- **Sterile Techniques:** Blood is collected using sterile needles and equipment to prevent various infections and diseases. *(Please see blood safety in healthcare settings for more)*
- **Health Screening:** This common procedure may check your weight, iron, temperature, heart rate, and other health related screenings before they let you donate.
- **Blood Screening:** Donated blood is thoroughly tested for infectious diseases such as HIV, hepatitis B and C, syphilis, and more. It is also tested for blood type and Rh factor

Blood Safety in Healthcare Settings

Preventing Healthcare-Associated Infections (HAIs), is key in a healthcare setting to maintain the wellbeing of their patients, Procedures are set to prevent the spreading of infections from causes of malpractice. If you feel as if you have been a victim to malpractice through medical facilities you can lodge a complaint via https://hcc.vic.gov.au/make-complaint or call: 1300 582 113 between 9.30am and 3.00pm, Monday to Friday, for International calls: +613 9032 3100.

- **Needle Safety Protocols:** Healthcare workers must adhere to protocols for the safe handling and disposal of needles and other sharp instruments to prevent needle-stick injuries.
- **Aseptic Techniques:** Medical procedures involving blood must be carried out under sterile conditions to avoid introducing infections.
- **Blood Handling Guidelines:** Guidelines are followed for the proper storage, labeling, and use of blood products to ensure safety for patients receiving transfusions.
- **Personal Protective Equipment (PPE):** Wearing gloves, masks, and gowns when dealing with blood or bodily fluids.
- **Hand Hygiene:** Thorough hand washing before and after patient interactions.
- **Blood Spill Management:** Immediate and safe cleanup of blood spills, with proper disinfection of the area and disposal of contaminated materials.

Blood as Food

Many Cultures and Religions consume blood as food, in some countries it can be considered as a delicacy.

Here is a list of examples of blood based foods:

- **Blodplättar:** Basically blood pancakes, This dish is common in Estonia, Finland, Norway, and Sweden, The dish consists of whipped blood (commonly pigs blood), water or pilsner, flour and eggs.
- **Black Pudding:** A dish originating from The United Kingdom and Ireland. This dish is a type of blood sausage that is made up of Beef blood or Pork Blood.
- **Taiwan's Pig Blood Cakes:** Originating from Taiwan is a dish that closely resembles cake pops as this cake is served on a stick.
- **Sanguinaccio dolce:** A sweet cream with chocolate and pig's blood base. This dish originates from Ireland.
- **Black Tofu/Blood Tofu:** Blood Tofu consists of coagulating blood with salt and water.
- **Snake Blood Wine:** A beverage that includes Snake blood in its wine originated in china.

These are very few examples of dishes that include animal blood products in them. If you are interested in trying out some of these dishes or learn about more check out The Red Cellar (TRC) . They have many blood based dish recipes! https://theredcellar.com/

Animal Blood Storage

Animal blood needs to be stored immediately after purchasing

Temperature:

- Refrigeration 33.80°F to 42.80°F (1-6°C): This temperature range is suitable for short-term storage, typically up to several weeks, depending on the preservation method used.
- Freezing -22 °F to -112 (-30 to -80°C): Longer-term storage can be achieved by freezing blood, which can preserve it for several months However, the freezing process must be managed carefully to avoid rupturing cells due to ice crystal formation.

Containers:

- Blood needs to be stored in a food safe container BPA-free plastic container that is labeled as freezer safe.
- It is also essential to label containers accurately with regard to contents and storage dates to prevent any risk of cross-contamination or expired use.

Monitoring and Maintenance:

- Regular monitoring of the storage conditions, such as temperature and integrity of the containers, is essential to maintain blood quality. Automated alarms can assist in detecting temperature fluctuations that may compromise the stored blood. Additionally, adherence to comprehensive hygiene protocols during blood handling can prevent contamination and degradation of blood products over time.

Animal Blood Safety Concerns

Pathogen Transmission

One of the primary concerns when it comes to consumption of animal blood is the risk of transmission of pathogens. This can include bacteria, viruses, and parasites. Blood can harbor zoonotic pathogens that may be transmitted to humans or other animals. This can serve as a serious health concern.

- Bacterial Infections: Blood products can be contaminated with bacteria like Salmonella and E. coli, which can cause foodborne illnesses.
- Viral Infections: Viruses such as foot-and-mouth disease or avian influenza can also be present in blood.

Prion Diseases

Prion diseases, such as bovine spongiform encephalopathy (BSE) or "mad cow disease." These are degenerative neurological diseases that can be linked to the consumption of infected animal tissues, including blood.

Chemical Contaminants

- Antibiotics: Residues from antibiotic treatments in livestock may persist in blood, raising concerns about antibiotic resistance in humans.
- Heavy Metals: Exposure to environmental contaminants, such as heavy metals, can lead to their accumulation in animal tissues, including blood, posing health risks upon consumption.

Maintenance Complications

Individuals may find it conflicting to store blood in a freezer for months at a time as a concern due to freezer burn or rupturing cells.

Has Your Blood Product Gone Bad?

Besides checking the expiration date, do you truly know if your blood product has gone bad? There is no guarantee of knowing if it has but there are signs to the product going bad see below the various ways you can check if your blood product has gone bad just by using your senses.

Changes in Color

The color of your blood can indicate if the blood is fresh or spoiled. Fresh blood is typically bright red due to the presence of hemoglobin. If you notice:

- Brown or Dark Color: This can indicate oxidation and spoilage of the blood product. Discoloration tends to occur when blood is exposed to air or improperly stored.

- Cloudiness: Blood serum that appears cloudy or hazy may suggest bacterial growth or contamination, pointing toward potential spoilage.

Foul Odor

Let's be real, blood doesn't actually smell that good normally but when it has spoiled that is a more reliable indicator that your blood product has gone bad. Just like with your gallon of milk you can tell if it has gone bad just by the smell. Fresh blood has a metallic scent due to iron, but if the product emits a sour or rancid smell, it may have spoiled. Specific odors to watch for include:

Sour or Fermented Smell: This can indicate bacterial activity or decomposition in the blood.

Off-Putting or Unpleasant Odors: Any foul smell that differs from the normal scent of blood should raise immediate concern regarding the product's safety.

Texture and Consistency

Consistency of blood can tell you that additives have been added to your product or the product is spoiled.

- Clot Formation: If the blood has begun to coagulate and form clots that were not present during proper storage, this may indicate spoilage.
- Separation: Blood serum should maintain a uniform consistency. If you notice a separation between the liquid and solid components, this could indicate deterioration.F
- Molding: The blood grows mold splotches that appear as a fluffy white, blue, green, substance.
- Freezer Burn: When air reaches through the packaging and into the product and develops weird grey leathering spots on the product. This can also be known as ice crystals.

Sources:

CDC Best Practices for Occupational Exposure to Blood:
https://www.cdc.gov/dental-infection-control/hcp/dental-ipc-faqs/occupational-exposure.html

FDA Blood & Blood Products:
https://www.fda.gov/vaccines-blood-biologics/blood-blood-products

FDA Food Handling:
https://www.fda.gov/food/buy-store-serve-safe-food/safe-food-handling

CFR - Code of Federal Regulations Title 21 Blood Handling Information provided by the FDA
https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=640.4#:~:text=(h)%20Storage.,center%20to%20the%20processing%20laboratory.

TRC Blood as Food:
https://theredcellar.com/category/blood-as-food/

Europe Commission:
https://health.ec.europa.eu/blood-tissues-cells-and-organs/blood_en#:~:text=Units%20plasma-,Legislation,processing%2C%20and%20storage%20to%20distribution.