Lawrence B. Palevsky, MD, ABIHM
220 Fort Salonga Road, Suite 101
Northport, NY 11768
Tel: 631-262-8505
Fax: 631-754-2909
www.drpalevsky.com

April 2019

Is There A Basis To Believe That Vaccines Contain Blood?

To Whom it May Concern:

In the course of my practice of pediatric and adolescent medicine, I've encountered parents who have chosen to withhold vaccinations from their children based upon religious objections.

As I understand it, placing the blood of others into their bodies is prohibited, as some parents interpret their religion's commandments.

Presenting this rationale in application for exemption from school immunizations rests on the factual question: Do components of blood remain in the final vaccine products?

Inasmuch as some school administrations have required evidence to prove that blood material is actually present in the vials of all vaccines, I've undertaken to review the best available evidence: The ingredients listed by the manufacturers.

As the report on the following pages indicate, it does appear that all of the mandated vaccines I've listed contain blood components. Perhaps this will resolve the medical aspect of this issue.

Lawrence B. Palevsky, MD

Whether a vaccine is manufactured using a cell line (e.g., human, animal, insect), cultivated in a chick embryo or using yeast, blood components still inevitably get into the final product.
https://www.historyofvaccines.org/content/articles/human-cell-strains-vaccine-development

When a vaccine is manufactured using a cell line propagated from human or animal tissue, the requirement for growth and propagation of these cell lines is fetal bovine/calf serum, human serum albumin, and/or bovine serum albumin, all of which are blood components. Serum from human and bovine sources are commonly used to support the growth of cells in culture.

Essentially, blood is ubiquitous to life, and all animal cells are nourished by the components that comprise blood. That includes the antigens within those cells, which later become the active ingredients in vaccines.

Serum and albumin provide the basic nutrients, both in the solution, as well as bound to the proteins for cells. These components are derived from the blood drawn from a bovine fetus via a closed system of collection at the slaughterhouse, or from blood donated by people. Fetal bovine serum is the most widely used serum-supplement for the in-vitro cell culture of eukaryotic cells. Serum components, including blood and its byproducts, inevitably end up in the final vaccine product. Thus, all vaccines manufactured using fetal calf serum, human serum, or bovine serum albumin, contain blood.

Two main human cell strains have been used to develop currently available vaccines, in each case with the original fetal cells in question obtained in the 1960s. The WI-38 cell strain was developed in 1962 in the United States, and the MRC-5 cell strain, also started with fetal lung cells, was developed using Hayflick's technology in 1970 at the Medical Research Center in the United Kingdom.

The following vaccine examples were developed using either the WI-38 or the MRC-5 cell strains and, therefore, contain fetal calf serum, bovine serum albumin, or human serum albumin in the final products, as listed in the manufacturing process description in the package inserts:

1. Hepatitis A vaccines [VAQTA/Merck, Havrix/GlaxoSmithKline, and part of Twinrix/GlaxoSmithKline]
2. Rubella vaccine [MERUVAX II/Merck, part of MMR II/Merck, and ProQuad/Merck]
3. Varicella (chickenpox) vaccine [Varivax/Merck, and part of ProQuad/Merck]
4. Zoster (shingles) vaccine [Zostavax/Merck]
5. Adenovirus Type 4 and Type 7 oral vaccine [Barr Labs]
6. Rabies vaccine [IMOVAX/Sanofi Pasteur]
7. Measles combo vaccine [ProQuad/]

Hayflick, L., Moorhead, P.S. The serial cultivation of human diploid cell strains. Experimental Cell Research. 1961; 25(3):585. https://cogforlife.org/Hayflick1961ExpCell.pdf

Additional cell lines that are used in vaccine manufacturing are derived from animals including monkeys (Vero cells) and dogs (MDCK cells). The propagation of these cells also requires supplementation with calf/bovine serum similarly as with WI-38 and MRC-5 cell lines.

The following vaccine examples were developed using either Vero or MDCK cells and contain calf serum, and in the case of Flucelvax, canine DNA and proteins in the final product as listed in the description of the manufacturing process in the package inserts:

1. DTaP combo vaccines [Kinrix/GlaxoSmithKline, Pediarix/GlaxoSmithKline]
2. Influenza vaccine [Flucelvax/Seqirus]
3. Polio vaccine Polio [IPV–Ipol/]
4. Japanese encephalitis vaccine [Ixiaro/Valneva]
5. Rotavirus vaccine [RotaTeq/Merck]
6. Smallpox vaccine [Vaccinia-ACAM2000/Emergent BioSolutions]

When a vaccine is manufactured using insect cells, its propagation requires supplementation with amino acids. Some amino acids, like proline and hydroxyproline, are precipitated from gelatin hydrolysates. https://www.tandfonline.com/doi/pdf/10.5504/BBEQ.2012.0134

Gelatin is a yellowish, odorless, and nearly tasteless substance that is made by prolonged boiling of skin, cartilage, and bones from animals. It's made primarily from the stuff meat industries have left over—pork skins, horns, and cattle bones. Gelatin by its manufacturing process contains blood components. Therefore, any vaccine supplemented with amino acids by its nature will have blood components.

The following vaccine examples were developed using insect cells, and were supplemented with amino acids derived from gelatin hydrolysates which were made from animal tissue and, thus, contain blood components.

1. Human Papillomavirus (HPV) vaccine [Cerverix/GlaxoSmithKline]
2. Influenza vaccine [Flublok/Sanofi Pasteur]

When a vaccine is manufactured using yeast, the manufacturing of the virus in yeast requires supplementation with amino acids. As mentioned above, some amino acids like proline and hydroxyproline are precipitated from gelatin hyrdolysates. Gelatin is derived from boiling animal skin, cartilage, and bones. Therefore, even vaccines manufactured using yeast cells inevitably contain blood components.

The following vaccine examples were developed using yeast culture and were supplemented with amino acids, some of which were derived from gelatin hydrolysates. These vaccines contain blood components from the amino acids derivation.

1. Hepatits B and combo vaccines [Comvax (combo of Pedvax/Merck and Recombivax/Merck)/Merck, Recombivax/Merck, Twinrix/GlaxoSmithKline]
2. Human Papillomavirus (HPV) vaccines [Gardasil/Merck, Gardasil 9/Merck]
3. Pneumococcal vaccines [PCV13 – Prevnar 13/Wyeth, PPSV-23 – Pneumovax/Merck]
4. Meningococcal vaccines [MCV4-Menveo/GlaxoSmithKline, MPSV4-Menomune/Sanofi Pasteur, MCV4-Menactra/Sanofi Pasteur]
5. Rotavirus vaccine [Rotarix/GlaxoSmithKline]
6. Td vaccines [Tenivac/Sanofi Pasteur, TDvax/MassBiologics]
7. Tdap vaccines [Adacel/Sanofi Pasteur, Boosterix/GlaxoSmithKline]
8. Typhoid vaccine [Vivotif/Berna Biotech]

When a vaccine is manufactured using chick embryos (eggs), similarly as with developing vaccines using human or animal cell lines, the final vaccine product will have blood components because the egg yolk has blood that supplies the growing chick.

The following vaccine examples were developed using chick embryo cells and contain egg proteins contaminated with blood from the embryo in the final product.

1. Influenza vaccines [Afluria/ Seqirus, Agriflu/Seqirus, Fluarix/GlaxoSmithKline, Fluvirin/Seqirus, Flulaval/GlaxoSmithKline, Fluzone/Sanofi Pasteur, Flumist/MedImmune]
2. Rabies vaccine [RabAvert/GlaxoSmithKline]
3. Yellow fever vaccine [YF-Vax/Sanofi Pasteur]

A BCG vaccine (Tice) manufactured by Merck contains glycerin which is a common ingredient used in many pharmaceuticals. Glycerin is derived from animal fat which also is inevitably contaminated with blood. Glycerin is an organic compound known more formally as glycerol. Its common sources are animal fat.

Many vaccines have gelatin. As stated, gelatin is a protein formed by boiling animal skin or connective tissue. Gelatin is used to stabilize vaccines so they remain effective after completion of the manufacturing process. All gelatin contained in vaccines is porcine in origin. All animal byproducts contain blood.
https://www.chop.edu/centers-programs/vaccine-education-center/vaccine-ingredients/gelatin

The following vaccine examples contain gelatin for stabilization purposes and thus contain blood components, through the manufacturing process, in the final product.

1. Influenza vaccine [Flumist/Medimmune]
2. Measles combo vaccine [MMR-II/Merck, ProQuad/Merck]
3. Rabies vaccine [Rabavert/Novartis]
4. Shingles (zoster) vaccine [Zostavax/Merck]
5. Typhoid oral vaccine [Vivotif/Berna Biotech]
6. Varicella (chickenpox) vaccine [Varivax/Merck]
7. Yellow fever vaccine [YF-Vax/Sanofi Pasteur]

As described in detail above, and from the table below, it is clearly evident that vaccines inherently are contaminated with blood components and blood byproducts. The manufacturing process does not remove them from the final vaccine product. [Blood-related material is in boldface in the following table.]

VACCINE	VACCINE INGREDIENTS	CONTAINS BLOOD?	SOURCE: PRODUCT INSERT DATED
Adenovirus https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm247515.pdf	sucrose, D-mannose, D-fructose, dextrose, potassium phosphate, plasdone C, anhydrous lactose, micro crystalline cellulose, polacrilin potassium, magnesium stearate, cellulose acetate phthalate, alcohol, acetone, castor oil, FD&C Yellow #6 aluminum lake dye, **human serum albumin, fetal bovine serum**, sodium bicarbonate, **human-diploid fibroblast cell cultures (WI-38)**, Dulbecco's Modified Eagle's Medium, monosodium glutamate	YES: Fetal bovine serum, human cells	Apr 2014
Anthrax (Biothrax) https://www.fda.gov/downloads/biologicsbloodvaccines/bloodbloodproducts/approvedproducts/licensedproductsblas/ucm074923.pdf	aluminum hydroxide, benzethonium chloride, formaldehyde, **amino acids**, vitamins, inorganic salts and sugars	YES: Gelatin from amino acids	Nov 2015
BCG (Tice) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm163039.pdf	**glycerin**, asparagine, citric acid, potassium phosphate, magnesium sulfate, Iron ammonium citrate, lactose	YES: Animal fat from glycerin	Feb 2009

DT (Sanofi) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM142732.pdf	aluminum potassium sulfate, peptone, **bovine extract**, formaldehyde, thimerosal (trace), modified Mueller and Miller medium, ammonium sulfate	YES: Bovine extract	Jun 2018
DTaP (Infanrix) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm124514.pdf	formaldehyde, glutaraldehyde, aluminum hydroxide, polysorbate 80, **Fenton medium (containing bovine extract)**, modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium	YES: Bovine extract	Nov 2013
DTaP-IPV (Kinrix) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM241453.pdf	formaldehyde, glutaraldehyde, aluminum hydroxide, **Vero (monkey kidney) cells, calf serum,** lactalbumin hydrolysate, polysorbate 80, neomycin sulfate, polymyxin B, **Fenton medium (containing bovine extract)**, modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium	YES: calf serum, monkey cells, bovine extract	Nov 2013
DTaP-HepB-IPV (Pediarix) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM241874.pdf	formaldehyde, gluteraldehyde, aluminum hydroxide, aluminum phosphate, lactalbumin hydrolysate, polysorbate 80, neomycin sulfate, polymyxin B, yeast protein, **calf serum**, **Fenton medium (containing bovine extract)**, modified Latham medium (derived from bovine casein), modified Stainer-Scholte liquid medium, **Vero (monkey kidney) cells**	YES: calf serum, bovine extract, monkey cells	Nov 2013
DTaP-IPV/Hib (Pentacel) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm109810.pdf	aluminum phosphate, polysorbate 80, formaldehyde, sucrose, gutaraldehyde, **bovine serum albumin**, 2-phenoxethanol, neomycin, polymyxin B sulfate, Mueller's Growth Medium, Mueller-Miller casamino acid medium (without beef heart infusion), Stainer-Scholte medium (modified by the addition of casamino acids and dimethyl-beta- cyclodextrin), **MRC-5 (human diploid) cells, CMRL 1969 medium (supplemented with calf serum)**, ammonium sulfate, and **medium 199**	YES: calf serum, human cells	Sep 2016

Hib/Hep B (Comvax) Combo of Pedvax and Recombivax https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm253652.pdf (Pedvax)	yeast (vaccine contains no detectable yeast DNA), nicotinamide adenine dinucleotide, hemin chloride, soy peptone, dextrose, mineral salts, **amino acids**, formaldehyde, potassium aluminum sulfate, amorphous aluminum hydroxyphosphate sulfate, sodium borate, phenol, ethanol, enzymes, detergent	YES: Gelatin from amino acids	Dec 2010
Hep A (Havrix) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm224555.pdf	aluminum hydroxide, **amino acid supplement**, polysorbate 20, formalin, neomycin sulfate, **MRC-5 cellular proteins**	YES: gelatin from amino acids, human cells	Dec 2013
Hep A (Vaqta) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm110049.pdf	amorphous aluminum hydroxyphosphate sulfate, **bovine albumin,** formaldehyde, neomycin, sodium borate, **MRC-5 (human diploid) cells**	YES: bovine serum, human cells	Dec 2018
Hep B (Recombivax) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm110114.pdf	yeast protein, soy peptone, dextrose, **amino acids**, mineral salts, potassium aluminum sulfate, amorphous aluminum hydroxyphosphate sulfate, formaldehyde, phosphate buffer	YES: gelatin from amino acids	Dec 2018
Hep A/Hep B (Twinrix) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm110079.pdf	formalin, yeast protein, aluminum phosphate, aluminum hydroxide, **amino acids**, phosphate buffer, polysorbate 20, neomycin sulfate, **MRC-5 human diploid cells**	YES: gelatin from amino acids, human cells	Aug 2012
Human Papillomavirus (HPV) (Cerverix) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM240436.pdf	vitamins, **amino acids**, **lipids**, mineral salts, aluminum hydroxide, sodium dihydrogen phosphate dehydrate, 3-O-desacyl-4' Monophosphoryl lipid A, **insect cell**, bacterial, and viral protein	YES: gelatin from amino acids, lipids from animal fat, insect cells	Nov 2013

Human Papillomavirus (HPV) (Gardasil) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm111263.pdf	yeast protein, vitamins, **amino acids**, mineral salts, carbohydrates, amorphous aluminum hydroxyphosphate sulfate, L-histidine, polysorbate 80, sodium borate	YES: gelatin from amino acids	Apr 2015
Human Papillomavirus (HPV) (Gardasil 9) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm426457.pdf	yeast protein, vitamins, **amino acids**, mineral salts, carbohydrates, amorphous aluminum hydroxyphosphate sulfate, L-histidine, polysorbate 80, sodium borate	YES: gelatin from amino acids	Oct 2018
Influenza (Afluria) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm263239.pdf	beta-propiolactone, thimerosol (multi-dose vials only), monobasic sodium phosphate, dibasic sodium phosphate, monobasic potassium phosphate, potassium chloride, calcium chloride, sodium taurodeoxycholate, neomycin sulfate, polymyxin B, **egg protein**, sucrose	YES: chick embryo cells	Jun 2018
Influenza (Agriflu) https://vaccines.procon.org/sourcefiles/agriflu-package-insert-2013.pdf	**egg proteins**, formaldehyde, polysorbate 80, cetyltrimethylammonium bromide, neomycin sulfate, kanamycin, barium	YES: chick embryo cells	Feb 2013
Influenza (Fluarix) Trivalent and Quadrivalent https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm220624.pdf	octoxynol-10 (Triton X-100)-tocopheryl hydrogen succinate, polysorbate 80 (Tween 80), hydrocortisone, gentamicin sulfate, **ovalbumin**, formaldehyde, sodium deoxycholate, sucrose, phosphate buffer	YES: chick embryo cells	Jul 2018
Influenza (Flublok) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM619551.pdf	monobasic sodium phosphate, dibasic sodium phosphate, polysorbate 20, **baculovirus and host cell proteins, baculovirus and cellular DNA**, Triton X-100, lipids, vitamins, **amino acids**, mineral salts	YES: gelatin from amino acids, insect cells	Mar 2018

Influenza (Flucelvax) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm329134.pdf	**Madin Darby Canine Kidney (MDCK) cell protein, MDCK cell DNA**, beta-propiolactone, phosphate buffer	YES: canine cells	Apr 2016
Influenza (Fluvirin) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm123694.pdf	nonylphenol ethoxylate, thimerosal (multi-dose vial–trace only in prefilled syringe), polymyxin, neomycin, beta-propiolactone, **egg proteins**, phosphate buffer	YES: chick embryo cells	Mar 2017
Influenza (Flulaval) Trivalent and Quadrivalent https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm112904.pdf	thimerosal, formaldehyde, sodium deoxycholate, **egg proteins**, phosphate buffer	YES: chick embryo cells	Nov 2016
Influenza (Fluzone: Standard) Trivalent and Quadrivalent, High-Dose, and Intradermal https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm356094.pdf	formaldehyde, octylphenol ethoxylate (Triton X-100), **gelatin** (standard trivalent formulation only), thimerosal (multi-dose vial only), **egg protein**, phosphate buffers, sucrose	YES: gelatin, chick embryo cells	Jan 2019
Influenza (FluMist) Quadrivalent https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM294307.pdf	ethylene diamine tetraacetic acid (EDTA), monosodium glutamate, **hydrolyzed porcine gelatin**, arginine, sucrose, dibasic potassium phosphate, monobasic potassium phosphate, gentamicin sulfate, **egg protein**	YES: gelatin, chick embryo cells	Jan 2018
Japanese Encephalitis (Ixiaro) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142569.pdf	aluminum hydroxide, **Vero cells**, protamine sulfate, formaldehyde, **bovine serum albumin**, sodium metabisulphite, sucrose	YES: bovine serum, monkey cells	Sep 2018

Meningococcal (MCV4-Menactra) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm131170.pdf	formaldehyde, phosphate buffers, Mueller Hinton agar, **Watson Scherp media**, Modified Mueller and Miller medium, detergent, alcohol, ammonium sulfate	YES: gelatin from amino acids	Apr 2018
Meningococcal (MCV4-Menveo) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm201349.pdf	formaldehyde, **amino acids**, yeast extract, Franz complete medium, CY medium	YES: gelatin from amino acids	Aug 2013
Meningococcal (MPSV4-Menomune) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm308370.pdf	thimerosal (multi-dose vial only), lactose, Mueller Hinton casein agar, **Watson Scherp media**, detergent, alcohol	YES: gelatin from amino acids	Mar 2016
MMR (MMR-II) https://www.fda.gov/downloads/BiologicsBloodVaccines/UCM123789.pdf	**Medium 199** (vitamins, amino acids, **fetal bovine serum**, sucrose, glutamate) , Minimum Essential Medium, phosphate, **recombinant human albumin**, neomycin, sorbitol, **hydrolyzed gelatin, chick embryo cell culture, WI-38 human diploid lung fibroblasts**	YES: fetal bovine serum, human serum, gelatin, human cells, chick embryo cells	Jun 2014
MMRV (ProQuad) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm123796.pdf	sucrose, **hydrolyzed gelatin**, sorbitol, monosodium L-glutamate, sodium phosphate dibasic, **human albumin**, sodium bicarbonate, potassium phosphate monobasic, potassium chloride, potassium phosphate dibasic, neomycin, **bovine calf serum, chick embryo cell culture, WI-38 human diploid lung fibroblasts, MRC-5 cells**	YES: gelatin, calf serum, chick embryo cells, human cells, monkey cells	Mar 2017
Pneumococcal (PCV13 – Prevnar 13) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM574852.pdf	**casamino acids**, yeast, ammonium sulfate, Polysorbate 80, succinate buffer, aluminum phosphate, soy peptone broth	YES: gelatin from amino acids	Aug 2017

Pneumococcal (PPSV-23 – Pneumovax) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM257088.pdf	Phenol, **gelatin**	YES: gelatin for stabilization of vaccine	May 2015
Polio (IPV – Ipol) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm133479.pdf	2-phenoxyethanol, formaldehyde, neomycin, streptomycin, polymyxin B, **monkey kidney cells, Eagle MEM modified medium, calf serum protein, Medium 199**	YES: calf serum, monkey cells	May 2013
Rabies (Imovax) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm133484.pdf	**Human albumin**, neomycin sulfate, phenol red indicator, **MRC-5 human diploid cells**, beta-propriolactone	YES: human albumin, monkey cells	Apr 2013
Rabies (RabAvert) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm312931.pdf	beta-propiolactone, potassium glutamate, c**hicken protein, egg protein**, neomycin, chlortetracycline, amphotericin B, **human serum albumin, polygeline (processed bovine gelatin)**, sodium EDTA, **bovine serum**	YES: chick embryo cells, human albumin, gelatin, bovine serum	Mar 2012
Rotavirus (RotaTeq) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142288.pdf	sucrose, sodium citrate, sodium phosphate monobasic monohydrate, sodium hydroxide, polysorbate 80, **cell culture media, fetal bovine serum, vero cells** ***[DNA from porcine circoviruses (PCV) 1 and 2*** *has been detected in RotaTeq. PCV-1 and PCV-2 are not known to cause disease in humans.]*	YES: bovine serum, monkey cells	Feb 2017
Rotavirus (Rotarix) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm133539.pdf	**amino acids**, dextran, sorbitol, sucrose, calcium carbonate, xanthan, Dulbecco's Modified Eagle Medium (potassium chloride, magnesium sulfate, ferric (III) nitrate, sodium phosphate, sodium pyruvate, D- glucose, concentrated vitamin solution, L-cystine, L-tyrosine, amino acids solution, L-glutamine, calcium chloride, sodium hydrogenocarbonate, and phenol red) *[Porcine circovirus type 1 (PCV-1) is present in Rotarix.]*	YES: gelatin from amino acids	May 2014

Smallpox (Vaccinia – ACAM2000) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142572.pdf	**human serum albumin**, mannitol, neomycin, glycerin, polymyxin B, phenol, **Vero cells**, HEPES	YES: human albumin, monkey cells	Mar 2018
Td (Tenivac) https://www.fda.gov/downloads/BiologicsBloodVaccines/UCM152826.pdf	aluminum phosphate, formaldehyde, modified Mueller-Miller **casamino acid** medium without beef heart infusion, ammonium sulfate	YES: gelatin for stabilization and from amino acids	Apr 2013
Td (TDvax) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm164127.pdf	aluminum phosphate, formaldehyde, thimerosal (trace), ammonium phosphate, **modified Mueller's media (containing bovine extracts)**	YES: bovine extract	Sep 2018
Tdap (Adacel) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142764.pdf	aluminum phosphate, formaldehyde, glutaraldehyde, 2-phenoxyethanol, ammonium sulfate, Stainer-Scholte medium, dimethyl-beta-cyclodextrin, modified Mueller's growth medium, Mueller-Miller **casamino acid medium** (without beef heart infusion)	YES: gelatin for stabilization and from amino acids	Jan 2019
Tdap (Boostrix) https://www.fda.gov/downloads/biologicsbloodvaccines/ucm152842.pdf	formaldehyde, glutaraldehyde, aluminum hydroxide, polysorbate 80 (Tween 80), Latham medium derived from bovine casein, **Fenton medium containing a bovine extract**, Stainer-Scholte liquid medium	YES: bovine extract	Feb 2013
Typhoid (Vivotif) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142807.pdf	yeast extract, casein, dextrose, galactose, sucrose, ascorbic acid, **amino acids**, lactose, magnesium stearate. **gelatin**	YES: gelatin	Sep 2013

Varicella (Varivax) https://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM142812.pdf	sucrose, phosphate, glutamate, gelatin, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride, sodium phosphate monobasic, potassium chloride, EDTA, **residual components of MRC-5 cells including DNA and protein**, neomycin, **fetal bovine serum, human diploid cell cultures (WI-38), embryonic guinea pig cell cultures, human embryonic lung cultures**	YES: monkey cells, bovine serum, human cells	Oct 2018
Yellow Fever (YF-Vax) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm142831.pdf	sorbitol, **gelatin, egg protein**	YES: gelatin, chick embryo cells	Jun 2016
Zoster (Shingles – Zostavax) https://www.fda.gov/downloads/biologicsbloodvaccines/vaccines/approvedproducts/ucm132831.pdf	sucrose, **hydrolyzed porcine gelatin**, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, neomycin, potassium chloride, **residual components of MRC-5 cells including DNA and protein, bovine calf serum**	YES: gelatin, monkey cells, bovine serum	Mar 2018

Quantitation Issues

Vaccine manufacturers might have you believe that components of animal and human blood derivatives are undetectable in the final vaccine product, or are found in such minute amounts that they are immaterial. However, newer detection methods have shown otherwise. Not only are blood byproducts detectable in final vaccines, they are possibly at 40 times the amount acceptable by established guidelines. Moreover, these remaining vaccine animal blood products are in quantitatively sufficient amounts to elicit allergic reactions to these components. Here's just a small sample of scientific articles supporting my assertion.

BSA in a single vaccine dose can be as high 40x the level acceptable and mandated by the WHO of the U.N.:
http://www.sciencedirect.com/science/article/pii/S0003269714001997

Evidence of Animal Proteins Causing Allergic Reactions After Vaccination:

Calf serum proteins as a possible cause of allergic reactions after vaccination
http://www.sciencedirect.com/science/article/pii/0092115773900553?via%3Dihub

Human B and T cell epitopes of bovine serum albumin as the cause of beef allergies
https://www.sciencedirect.com/science/article/pii/S0006291X02003819

Sensitization to serum albumins in children allergic to cow's milk and epithelia
https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1399-3038.2007.00548.x

Sensitization to bovine serum albumin as a possible cause of allergic reactions to vaccines
http://www.sciencedirect.com/science/article/pii/S0264410X17301731