WHAT GOES INTO VACCINES

Ingredient lists can be intimidating — especially those of vaccines, which are made up of ingredients with scientific, complicated-sounding names. But vaccines are essentially made up of **three kinds of ingredients** that each play a key role in creating protection against severe diseases: **active ingredients, adjuvants and preservatives/ residual ingredients.**[1]

01 **Active ingredients provide immunity to a specific disease.** They can be a virus that has been inactivated or weakened enough to no longer be infectious, or they can be proteins, sugars and/or genetic material from the virus, such as RNA and DNA.[2] This genetic material does not mix with our DNA; it helps our cells learn how to recognize a specific disease.

02 **Adjuvants are added to make a vaccine more effective.** One way they can do this is by slowing the release of the particles that trigger an immune response,[3] making the response longer and stronger. Aluminum salts, such as aluminum hydroxide and aluminum phosphate, are one common type of adjuvant.[4]

03 **Preservatives and residual ingredients prevent contamination and keep vaccines effective while they are stored.** To prevent bacterial contamination, some vaccines include antibiotics that people are not commonly allergic to, like neomycin and kanamycin.[1] Stabilizers, like sucrose and lactose, can be added to vaccines to make them last longer after manufacturing.[5]

Vaccines may also contain residual materials, such as egg proteins, from the cell culture used to create them.[1] They do not contain live human or animal cells.

Are vaccine ingredients safe?

Yes, the ingredients used in vaccines are safe. They are all found naturally or have been used for decades, and they have been tested extensively to ensure safety.[6] But there are still many myths and misconceptions about the safety of vaccines.

For example, **vaccines do not have harmful levels of mercury or formaldehyde.** Some vaccines use a preservative called thimerosal, which contains a type of mercury called ethylmercury. Ethylmercury is not the type of mercury that is toxic to humans. (Although vaccines containing thimerosal are safe, all vaccines have thimerosal-free versions available.)[1]

Some vaccines may contain residual quantities of formaldehyde, which is used during the vaccine manufacturing process to kill viruses or inactivate toxins. The amount found in vaccines is so small (less than the amount naturally found in the human body) that it is harmless.[1]

Vaccines are safe and have been proven to protect against severe outcomes of disease — making it crucial for everyone to have equal access to them.

[1] Centers for Disease Control and Prevention (CDC), http://bit.ly/3nGrkle.

[2] Gavi, http://bit.ly/3MgudJV.

[3] Awate, Babiuk, and Mutwiri, "Mechanisms of Action of Adjuvants," Frontiers in Immunology 4, no. 114 (May 2013): https://bit.ly/3ZYu29s.

[4] CDC, http://bit.ly/3ZEyRVg.

[5] Food and Drug Administration, http://bit.ly/40ZyRjN.

[6] CDC, http://bit.ly/3MdkpAl.

For more information on vaccines, visit the Vaccines Cause Adults page at: bakerinstitute.org/vaccines-cause-adults.

Funding for the dissemination of research findings was generously provided by the Greenwall Foundation through a Bridging Bioethics Research & Policymaking grant. This is a joint collaboration between the Baker Institute Center for Health and Biosciences Vaccine Project and The Immunization Partnership.

VACCINES CAUSE ADULTS