Introduction
Vaccines have proved to be one of the most powerful & effective ways of reducing disease before travel is imperative to ensure global public health & to help individuals stay healthy during and after their travels.

Vaccination needs are based on the traveler’s prior immunizations, health conditions, risk of infections exposures while travelling and the countries to be visited.

Vaccines are expensive, often unstable & need to be stored and transported either frozen or 4c, they may be inactivated chemical such as methanol which used to sterile syringe or the skin & produce poor mucosal response.

However, if we are to maximize their impact on global health, then we need to develop new vaccines for additional disease as well as to improve their supply & delivery, particularly in developing countries. Thus food vaccines might save millions who now die for lack of access to traditional inoculants.

Development of Edible vaccines
Creating edible vaccines involves introduction of selected desired gene into plants and then inducing these altered plants to manufacture the encoded proteins. This process is known as transformation & the altered plants are called transgenic plants, like conventional subunit vaccines, edible vaccines are composed of antigenic proteins and are devoid of pathogenic genes. Thus, they have no way of establishing infection, assuring its safety especially in immunocompromised patients.

Advantage of edible vaccines
Edible vaccines hold great promise as a cost effective, easy to administer, easy to store, fail-safe and sociocultural readily acceptable vaccine delivery system, especially for the poor developing countries, enhance compliance, especially in children & because of oral administration would eliminate the need for trained medical personal, seroconversion in the presence of maternal antibodies, generation of systemic & mucosal immunity, delivery of multiple antigens, plant derived antigens assemble spontaneously into oligomers and into virus like particles.

Application of edible vaccines
Activate both mucosal and systemic immunity as they come...
in contact with the digestive tract lining. This would provide first line defense against pathogens invading through mucosa like mycobacterium tuberculosis and agents causing diarrhea, pneumonia, STDs, HIV, etc. Scientist place high priority on combating the diarrheal agents, Norwalk virus, Rotavirus, vibrio cholera and enterotoxigenic E. coli [ETEC] responsible for about three million infant deaths/year mainly in developing countries. Malaria remains one of the most significant causes of human morbidity and mortality worldwide, Measles highly contagious viral disease almost one million children die from the measles and many of survivors are weakened by pneumonia or encephalitis or become deaf.

**Candidates for edible vaccines**

Foods under study of edible vaccines include bananas, potatoes, and tomatoes as well as lettuce, rice, wheat, soybean & corn. When choosing a plant to be used as a vaccine it’s important that it is a hardy, palatable plant with high nutritive and protein content. The plant best is indigenous to the country in which it is to be used and should be able to be transformed with relative ease.

<table>
<thead>
<tr>
<th>Si No</th>
<th>Vaccines</th>
<th>Vector Used</th>
<th>Disease/Condition it is used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hepatitis B virus</td>
<td>Tobacco, Potato</td>
<td>Hepatitis B</td>
</tr>
<tr>
<td>2</td>
<td>Norwalk virus</td>
<td>Tobacco, Potato</td>
<td>Diarrhea, Nausea Stomach craps</td>
</tr>
<tr>
<td>3</td>
<td>Rabies virus</td>
<td>Tobacco</td>
<td>Rabies</td>
</tr>
<tr>
<td>4</td>
<td>Transmissible Gastroenteritis Corona virus</td>
<td>Tobacco, Maize</td>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>5</td>
<td>Rabbit hemorrhagic diseases virus</td>
<td>Potato</td>
<td>Hemorrhage</td>
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<tr>
<td>6</td>
<td>HIV virus</td>
<td>Tomato</td>
<td>AIDS</td>
</tr>
<tr>
<td>7</td>
<td>Vibrio cholera</td>
<td>Potato</td>
<td>Cholera</td>
</tr>
</tbody>
</table>

Examples of Edible Vaccines.

**Conclusion**

Edible plants derived vaccine may lead to future of safer and more effective immunization. They would overcome some of the difficulties associated with traditional vaccines, like production, distribution and delivery, they can be incorporated into the immunization plants, thus can solve poor countries problem.

**References**