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## Outbreak of Listeriosis Associated with Consumption of Vegan Cheese

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1 **Outbreak of Listeriosis Associated with Consumption of Vegan Cheese**

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27 **To the Editor:** Vegan cheese substitutes have been suggested as an alternative to raw-milk dairy  
28 cheeses for persons at risk for listeriosis, including pregnant persons. We report an outbreak of  
29 listeriosis in France between April and December 2022 that involved four pregnant women who  
30 delivered preterm (median gestation, 32 weeks) and one case of meningoen­cephalitis in a 38-yearold  
31 person with compromised immune function. An alert in Europe led to the identification of three  
32 additional cases of listeriosis, which occurred in Belgium (in a 3-year-old child), in Germany (in a  
33 person with pregnancy-associated sepsis), and in the Netherlands (a maternal–neonatal case of  
34 neonatal meningitis). The *Listeria monocytogenes* clinical isolates were genetically closely related ( $\leq 1$   
35 allelic difference; type L2-SL475-ST504CT11461 on core genome multilocus sequence typing)<sup>1</sup> to  
36 those from vegan cheeses and their production environment. The exposure of all these affected  
37 persons to incriminated products was epidemiologically proved, which led to a product recall and an  
38 urgent request from the French national public health authority to inform consumers, especially  
39 pregnant persons, about the risk of listeriosis from the consumption of vegan cheese substitutes.

40 Made from raw almond, cashew, or coconut milk, these alternative semisoft cheese substitutes mimic  
41 dairy cheeses (e.g., Camembert, goat cheese, and blue cheese). The vegan cheeses that were  
42 associated with these maternal–neonatal cases were exported to Europe, sold in retail stores, and  
43 available on the Internet. Such products are promoted as being healthier to consume than dairy  
44 cheeses and free of zoonotic foodborne pathogens because they are plant-based. However, these  
45 products did not undergo a hygiene step such as pasteurization that could control contamination at  
46 the level of raw materials or from a contaminated production or postproduction environment.

47 *L. monocytogenes* is a ubiquitous bacterium that can contaminate raw dairy products, meat, fish,  
48 seafood, vegetables, and fruits, including nuts, and its prevalence is predicted to increase with  
49 climate change.<sup>2</sup> In a study in which *L. monocytogenes* was inoculated in beverages derived from nut  
50 milks and in bovine milk, the proliferation of bacteria was greater in the plant-based milks.<sup>3</sup> The  
51 physicochemical properties of these products (e.g., pH and water activity) allow the growth of *L.*  
52 *monocytogenes*. Although previous outbreaks due to salmonella contamination have been associated  
53 with vegan cheese substitutes in the United States,<sup>4,5</sup> vegan cheese substitutes continue to be  
54 inappropriately marketed as a safe alternative to raw-milk dairy cheese to populations at increased  
55 risk for foodborne infection, such as pregnant persons. This outbreak highlights both the lack of data  
56 on the contamination of these products by foodborne pathogens, including *L. monocytogenes*, and  
57 the need for manufacturers of vegan cheese substitutes to consider this risk in their production  
58 processes, as with any other ready-to-eat product.

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63 Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org

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