Abstract
Picky eating, which includes behaviors such as limited dietary variety, neophobia, food refusals, and sensory sensitivities, can be a source of stress for families. Parents can influence their children’s mealtime behavior through the feeding practices they use when offering foods. Some practices are counterproductive to establishing healthy eating habits and should be avoided, but caregivers need alternative behaviors to replace them. Parents should be encouraged to keep trying after a food is refused, as children may need to be exposed to a food several times before it is accepted. Varying the preparation changes the taste, texture, and appearance of food, and children may prefer some variants to others. Some children refuse foods to express independence; thus, providing choices between two healthy options may allow children to express a preference without saying “no” altogether. Coercive feeding practices such as the use of pressure to eat or using food as rewards should be avoided, as these can create negative associations with the food or meals and lead to food refusals. Instead, caregivers can model eating and enjoying the food. Nonfood rewards, such as praise or stickers, can also be used to encourage children to taste a food without negative outcomes.

Introduction
Picky eating can be frustrating to parents who worry about their children’s growth and development, but many children go through a picky eating phase in early childhood and then their eating behavior improves [1]. The first years of
life are an important period of dietary diversification when children develop eating habits that continue into later life. Foods introduced in early childhood tend to be better accepted than those first encountered later in childhood or adulthood, making the toddler years a sensitive window for expanding the range of foods an individual consumes.

Picky eating is a broad construct that has been defined in a variety of ways by different researchers and likely is comprised of several types of behaviors that contribute to a perception of a limited diet or food refusals. Some of the most common behaviors of picky eaters include limited dietary variety, neophobia, food refusals, less enjoyment of eating, and sensory sensitivities [Fries et al., unpubl. data].

Picky eaters have been reported to consume less of certain food groups, such as vegetables [2], and may have lower intakes of some macro- and micronutrients [3]. Due to their low intake of fiber-rich foods such as whole grains and vegetables, picky eaters may be at increased risk for digestive troubles such as constipation [4, 5], but there is little evidence that picky eaters are at increased risk of underweight or malnutrition [6]. Beyond the potential impact on children’s diet, picky eating can have a negative impact on the family, causing stress or conflicts at mealtimes and causing parents to worry about their child’s health [7]. Therefore, it is valuable to understand the relationship between feeding practices and children’s food acceptance, their potential consequences on dietary intake, and promising solutions to help parents manage the challenges of a picky eating phase.

Parents influence their children’s diet and mealtime behavior through the foods offered, as well as through the feeding practices they use when offering them [8, 9]. The feeding relationship is a two-way interaction, with parents influencing their children’s eating behaviors and children’s behaviors affecting the parents’ feeding practices [10, 11]. Parents’ feeding practices influence children’s intake and acceptance of foods, and a recent study found that picky eaters may be particularly sensitive to feeding practices [12]; thus, it is important for parents of picky eaters to apply positive feeding behaviors such as eating together as a family, modeling eating nutritious foods, and continuing to offer food variety.

Parents may also adapt their feeding behaviors in response to a child that is perceived to be picky [12, 13]. Parents’ assumptions about what children will or will not eat may keep them from offering a wider variety of foods, and fear of rejection and food waste may lead them to not offer foods that were previously rejected [10]. Parents may also change the foods they offer and their feeding practices based on the child’s perceived weight, or what (or how much) the parent believes the child should be eating. Parents’ beliefs about how much
children need to eat may influence their perception of picky eating and may lead them to use specific practices like pressure to eat and asking the child to clean their plate. A recent longitudinal analysis suggests that the relationship indeed goes in both directions: parents respond to picky eating by increasing pressure on the child to eat, and this in turn predicts further picky eating, which can result in a vicious cycle [11]. It is, therefore, important to evaluate how parents can effectively intervene when encountering difficult eating behaviors in their children and to give them useful alternatives to parenting practices that have been shown to be counterproductive in establishing healthy eating habits.

Parents might benefit from education about why children may be acting picky to help them to understand, and potentially address, the causes. However, they are also likely to benefit from advice on feeding practices that can help reduce or avoid food refusals, unpredictable food preferences, and requests for special meals, as well as information about which behaviors or facial expressions constitute a “surprise” rather than a “rejection” when trying a new food. It is also important for parents to remember that their child is an individual with preferences and needs, which may not always correspond to those of the parents, and that it is normal to dislike some foods and express preferences for other foods [14]. Educating parents on these topics might change their perception about their child’s eating behaviors and provide some practical guidelines and ideas to appropriately address picky eating behaviors.

In general, mealtime structure, routines, and regular eating times [15] help ensure that children are expecting to eat and feeling hungry at mealtimes. Caregivers can also reduce between-meal eating occasions and avoid offering snacks or energy-containing beverages such as milk or juice shortly before meals. Similarly, oral nutritional supplements taken too close to mealtimes can be disruptive to children’s appetites and may take away opportunities to learn and try foods. Children are most receptive to eating at mealtime when they are hungry. In addition, when meals are consumed at a table and without distractions from other activities such as toys or television, children will be more focused on the meal. When food is competing with more attractive playtime activities, children may get up from the table before they are full. Clear and consistent parenting practices or rules on when, how often, and which foods can be consumed will also help children know what to expect and what is expected of them at mealtimes.

Parents and other caregivers may use a variety of different feeding practices when trying to convince their children to eat healthy foods, but some have better success rates and long-term outcomes than others. It is important when giving guidance on feeding children that not to simply provide a list of “don’ts,” which
will leave parents uncertain of what they should do. When possible, an alternative, positive behavior should be presented that parents can adopt in its place. For this reason, we have provided our own recommendations below, following a similar format: first a behavior or situation that should be avoided or changed, followed by a suggested alternative.

Do Not Give Up if the Child Does Not Like Something the First Time

When introducing a new food to a child, parents typically give up after approximately 3 tries if the child rejects the food [16, 17]. However, children’s taste preferences change with time, and they can also be influenced by the child’s previous experience with foods. If parents stop offering a food after just a few refusals, they will not be able to observe this evolution, and the child’s diet will remain limited.

Instead, Use Repeated Exposure, Vary Preparations, and Cook Together

Repeated exposure is when an individual tastes a food on several occasions. This has been shown to lead to improved acceptance of the target foods, and it has been frequently used to promote vegetable consumption in young children [18]. The process is easiest in infants, as the caregiver can control which foods are offered on a spoon, and a baby will usually take at least one bite of what is offered. Older children may require more exposures, and children may be less willing to taste novel or previously rejected foods [19]. As children’s dietary variety grows, they may become more willing to taste and accept future unfamiliar foods [20].

Repeated exposure does not necessarily mean that the food has to be prepared or served in exactly the same way each time; in fact, to the contrary, by varying the cooking method, visual appearance, texture, and combinations of flavors, caregivers may be able to discover a version of the target food that is accepted by the child. For example, mixing flavors, such as by adding dips, sauces, or seasonings, can also help to make new foods seem more familiar and encourage children to taste them [21]. Like taste, texture can have a large impact on children’s food acceptance [22]. Longitudinal studies have found that previous texture exposure and the timing of introduction of textures during complementary feeding may predict children’s future food acceptance [23]. Some texture avoidances, particularly to foods that need to be chewed more, may be due to children’s mastication skills not being fully mature, as children
continue to develop strength and coordination in their jaws over the first few years of life [24]. If children seem to reject foods due to the texture, caregivers can try using other preparation methods such as boiling and steaming, which have been shown to be better accepted by children than other cooking styles [25, 26]. Crunchiness and a uniform appearance can also contribute to acceptance. Sliced vegetables, whether prepared as sticks or fun shapes (like stars), may also be better accepted than whole vegetables, potentially due to both being easier to bite and its visual appearance [27]. Other examples of simple texture modifications include freezing squishy fruits or cutting foods into more manageable pieces [28].

In addition to repeated taste exposures, there are other ways that children can become familiar with a novel food. One way is through sensory play with food, in which children use various senses, such as smell, vision, and touch, to explore food objects [29] and sensory education, teaching children about the sensory properties of foods, as these methods can improve the children’s willingness to try a food and their expectations to like it [30]. Involving the child in meal preparation is also an effective way to improve eating behaviors in children, both through the additional hands-on experience with the foods and through the child’s pride from helping create the meal [31, 32]. Visual exposure, either directly to foods or through books about food [33], especially if the book contains positive messaging about the food, can also create familiarity. Asking questions and making the activity more interactive can help build positive associations with the food.

**Do Not Pressure the Child to Eat**

There are many strategies that parents can use to encourage a child to eat a particular food [28]. In some scenarios, such as when a child is resistant to eating something, parents may use more coercive techniques such as pressuring the child to eat more or demanding that they finish all of the food on the plate. The use of pressure could range from insisting that children eat a particular food to telling them that they cannot leave the table until they finish or to physically feeding the children. Caregivers should avoid pressuring the child to eat, as this can create a stressful context, which can lead to negative associations with the target food or even general mealtime avoidance [34]. For the same reason, negative interactions such as arguments among family members should be avoided at mealtimes so that the child does not create negative associations with the dining experience. In contrast, an optimal mealtime environment in terms of parenting style and feeding practices,
mealtime structure, and a positive nutrition climate can all contribute to children’s eating behaviors and intake; that is to say if the mealtime environment is pleasant, children will be more willing to sit at the table and to eat the foods they are offered.

As many caregivers pressure children to finish the food on their plate as a way of avoiding food waste, an alternative solution is to offer children small portions at the beginning of the meal and then to give additional small servings if the child is still hungry. This will not only help the child to not feel overwhelmed by the amount of food on the plate but can also reduce plate waste.

**Use Modeling and Reasoning Instead**

One of the most successful ways to convince a child to try a food is for another person to model eating and enjoying it [28]. The model can be a parent, teacher, sibling, or peer. When families eat meals together and consume the same foods, this provides an excellent opportunity for modeling. There may be some barriers to caregivers modeling eating certain foods, such as that adults are less likely to model eating or to serve foods that they themselves dislike, and that they may not consider offering “exotic” foods to children with the expectation that these will be rejected. Further, parents of picky eaters may not offer foods they expect their child to refuse or that the child previously rejected [10]. Recent reviews of interventions to increase vegetable consumption showed that increasing the amount and variety of vegetables available in the home as well as their accessibility (e.g., preslicing fruit) both improve intake [32, 35].

Parents who give a reason why the child should taste something, such as by talking about the good taste of the food or its nutritional value, rather than simply telling them to eat it, may also help children be willing to taste a new food [36, 37]. This practice can also create intrinsic motivation for the child to eat the food in the future, as they will appreciate the food for its own properties (e.g., taste and health benefits) rather than only eating it when they expect an external reward.

**Do Not Use Food Rewards**

Some feeding practices have negative associations with food acceptance. For example, parents should avoid using one food as a reward for eating another food, as this can have negative short- [28] and long-term [38] consequences, such as
food refusals and decreased liking of the target food. Using foods as rewards or to modify child affect (e.g., to cheer her up when sad) has also been shown to be associated with later emotional eating [39], as children learn to associate foods with certain emotional states.

**Use Nonfood Rewards or Praise Instead**

In contrast, nonfood rewards, such as praise or stickers, can be used to encourage children to taste a food without creating these negative outcomes [40]. It should be noted that such rewards should be reserved for encouraging children to taste a food, but the child should not be required to finish the food. Using any kind of extrinsic rewards for plate cleaning can override children’s internal satiety cues and lead to eventual overeating.

**Do Not Cook Separate Meals for Your Child**

In general, parents should be encouraged not to give up when a child refuses a food a few times and continue to offer it while avoiding preparing separate meals for picky eaters. Providing an alternative meal for a child who refuses the food initially offered reinforces the food refusal behavior. Further, if children are regularly provided with a limited range of “accepted” foods, this reduces opportunities for the child to experience new tastes or to have additional exposures to foods that they have not previously accepted. Thus, this behavior can perpetuate the child’s limited diet.

**Provide Choices among Healthy Options Instead**

Some children may refuse to eat a food simply as a way of asserting independence. In general, young children are not able to control many aspects of their environment, and they may seek to capitalize on opportunities to influence certain situations where they can exert some control, such as mealtimes. Often, when parents tell their child to eat something, the options that the child has are either to obey the parent or to refuse. However, if parents give children choices between preselected healthy options, such as two different kinds of vegetables to have as a side dish, this may allow children independence in expressing a preference without saying “no” altogether [41].
Conclusions

Picky eaters display several different types of behaviors. Although caregivers of picky eaters should avoid some feeding practices, they should be provided with alternative behaviors with more positive outcomes. Some key behaviors to promote include: repeated exposure, modeling healthy eating, providing mealtime structure, and providing choice.

Disclosure Statement

L.R.F. is an employee of Nestlé Research. K.H. is a former employee of Nestlé Research.

References

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