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**House Health and Human Services Committee
Testimony Re: HB 2137
Presented by: Leslie Bonci, MPH, RD, LDN
on behalf of
Kansas Beverage Association
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Mister Chairman, Members of the Committee:

My name is Leslie Bonci, and I am here to testify today regarding proposed legislation on restrictions of certain beverages that are sold in schools. I am the Director of Sports Nutrition at the University of Pittsburgh Medical Center and an adjunct professor in the School of Dental Medicine at the University of Pittsburgh. As a registered dietitian, and mother of two sons, I share your concern regarding the health issues facing our nation's children. However, singling out a particular beverage or food, and banning those items is not going to solve the health and obesity crisis in our schools.

In addition, the concept of "forbidden" foods/beverages may result in increased desire and larger portions being consumed than what the children would obtain in school. The concept of nutrition encompasses food (what we eat/drink) as well as the eating habits (why, when, where and how much) we eat and drink. Energy balance is also a critical part of the equation, in terms of intake as well as expenditure.

The Kansas Beverage Association is an ally in the fight against childhood obesity. The industry believes strongly in choice at the local level as well as providing age-appropriate items in the machine. Wellness is an integral concept and the industry is working hard to partner with the schools in terms of beverage offerings and nutrition education and physical activity programming. It takes a state, a school district, a community, and concerned and committed parents and children to reverse the current childhood health trends. Working with rather than against the beverage industry is a prudent step in improving the nutritional and physical well-being of our children.

The ABCs of Beverages in the Schools Programs

The current and future health of our nation's children is a topic of growing interest and concern for parents, schools, communities, the health care system, industry, and government. Finger pointing, targeting specific items, and "restrictive" legislation are supposed to improve the health and well being of our children, by removing certain products from the schools. An effective call to action should not be a one-sided elimination approach, but instead, be composed of informed choice through education on nutrition and fitness.

Let's consider the ABC acronym. Achieving a Balance through Choice. Achievement is a word children, parents, educators and school partners understand well, and desire. There is a great deal of emphasis on scholastic aptitude, as there should be, but perhaps fitness aptitude should receive more attention. For all children, school is the setting for academic achievement, and for many children, school must be the setting for physical fitness since home environments may not be conducive to activity. Children and adolescents who are more physically fit will perform better in the classroom (Stanford study). The acronym NEAT (Nutrition, Exercise, Aptitude Test) could become a benchmark for health.

Balance consists of energy intake through foods and beverages as well as energy expenditure through daily activities and exercise. Children need to understand the concept of balance throughout their day, from the school environment to home. Choice needs to be part of the discussion and decision making process. Children and adolescents do not want to be told what to do, but instead need to be educated on how to make appropriate choices in terms of food, eating habits and physical activity. Children have different food and taste preferences, as well as different backgrounds, cultures and customs. Schools can make the choice in terms of which beverages are sold in the vending machines. The beverage industry provides the schools with choices in terms of which products are sold at different age levels. Schools can also make a choice as to how revenue generated through vending machine sales is used in that particular school district.

Points to consider

Today's children have grown up differently. They may come from single- family homes, or homes with two working parents, so that a sit down dinner is non-existent. The new paradigm for physical activity is the television or computer instead of outside play. The dinner table has been replaced by e-meals, or in front of the television dining, or in car eating while en route to another activity. Milk is not always part of every child's meal, juice may or may not be in the home, and not every child likes water. So, when the discussion turns to beverage choices in schools, the options should be as inclusive as possible.

It is possible to have an impact at the point of education, the school. What children are served for breakfast and lunch, the time allotted for meals, and physical education offerings can be standardized for the maximum benefit of the children. This is not a message of elimination, but of opportunity. The beverage industry will continue to work with the schools to offer age-appropriate beverages at certain non-competing hours of the day. Funds generated from sales can and should be targeted to physical activity initiatives to create or expand upon existing programs to provide more fitness options for children and adolescents.

The Nutrition perspective

There are several points that need to be taken into consideration. Nutrition is an equation of food choices and eating habits. Energy balance is comprised of energy intake and energy expenditure. The energy intake side of the equation is composed of total calories derived from carbohydrate, protein and fat consumed in food and beverages, food preferences, and proper hydration. Energy expenditure is a combination of physical activity as well as the energy demands of growth and development.

Much of the discussion focuses on "bad" or "competing foods". It is important to clarify that the beverage industry has never intended for a their products to be a meal replacement. Many children,

adolescents, and adults enjoy something to drink with meals, ranging from a fluid alone, such as water, to a multi-nutrient beverage such as milk. Children need to be optimally hydrated for mental performance as well as for physiological functions. If the child does not like the beverage offerings, he/she won't drink, and that may be detrimental to mental and physical functioning. It is important to realize that with the exception of milk, beverages such as sports drinks, carbonated soft drinks and juices, are carbohydrate-based. This points to the issue of choice and balance.

Children need to be educated on how these products fit in to one's overall diet. In other words, it is not just an addition, but a replacement for something else. If a child opts to consume his/her discretionary calories from a carbonated beverage or juice, then, he/she needs to be able to give something else up, such as a candy bar or cookie. Certainly, children need to be educated on carbohydrate choices and the importance of whole grains, fruits and vegetables in the diet. The lack of intake of these items may be more causal with regards to chronic disease prevalence, than the presence of a sweetened beverage in the diet.

For many adults and children, it is an abstract concept to think of beverages as a source of calories since they are not filling. This is why education is so important. Children need to learn and apply the lessons of balance and compromise. In other words, if a child has a higher calorie beverage at school, they need to try to consume lower calorie beverages at outside of school. If one drinks a higher calorie beverage, they should choose to add more exercise to the day to achieve energy balance.

It is also important to understand the context in which beverages are consumed. Are they stand alone, or as part of a meal. An area of great concern is the largeness of portions consumed by children and adolescents. Vending machines offer controlled portion sizes either in bottles or cans, ranging from a minimum of 8 ounces to a maximum 20 ounce container. Restaurants, convenience stores and fast food establishments offer soda fountain beverages that start at 12 ounces and increase from there. Children and adolescents who stop at a convenience store after school could buy a 24 ounce or larger beverage, which is a greater volume than the items offered in school. In addition, if there are soft drinks at home, it is easier to pour a larger volume, especially if one has larger glasses in the home. Thus, if there are fewer options in schools, children may be more likely to want and consume larger volumes of that same beverage in the home, or outside of school grounds.

Setting the record straight

The debate around beverages centers on ingredients within the products, the sugar. The focus has shifted away from food to specific nutrients, such as carbohydrate. Children consume food, whether in solid or liquid form, not just nutrients. A beverage is a fluid (water, diet soft drinks, unsweetened tea) and a source of carbohydrate (juice, sports drinks, tea, soft drinks) and in some cases protein as well (milk). There are many misconceptions regarding the health effects of these products as well as volume of beverages consumed on a daily basis. Certainly, no one wants children to consume beverages to the exclusion of all other foods, and the reality is that many children do not consume carbonated soft drinks at all. The average daily consumption of soft drinks by children and adolescents is 12 ounces per day. (French et al, 2003). However, this represents in school, at home, dining out, and weekend consumption. Only twenty percent of children consume any type of beverages from school vending machines, and the frequency is once a week. (Ginevan, 2004).

Research from the University of North Carolina has shown that among children ages 12-18 in the years 1977-1996:

53% of calories are consumed at home

19% of calories are eaten out

8% of calories are consumed in school (bringing or buying school breakfast/lunch)

1% of calories are consumed from vending machines

What the science says

Soft drink consumption has been linked with obesity, bone problems, cavities, diabetes and hyperactivity. None of these diseases have a single cause, nor one solution. The goal is to achieve optimal health and well-being for our children in terms of food choices and physical activity. This is accomplished with inclusion, not restriction when it comes to food and beverage selections.

Obesity

Childhood obesity is a topic of interest and concern. Current statistics show that 13% of 6-11 year old children and 14% of 12-19 year old children/adolescents are overweight. (Ogden, 2002). As a stand alone disease, obesity is a health risk, and in addition, being overweight or obese increases the risk of the development of diabetes, high blood pressure, heart disease, musculoskeletal disorders, and exacerbates conditions such as asthma. However, obesity is not caused by beverage consumption. It is a multi-factorial disease resulting from excessive energy intake (from a variety of nutrients rather than one food source), and poor eating habits coupled with inadequate energy expenditure. In addition, other contributing factors include:

- Parental Influence (Food knowledge and food purchasing patterns)
- Portions (children may be overfed at an early age)
- Genetics (children whose parents are overweight are more likely to be overweight)
- Latchkey children (need to prepare food for themselves, and food may be a source of companionship)
- Environment (safety concerns, limited food choices due to lack of supermarkets in the neighborhood)
- Economic status (Fewer discretionary dollars increase the reliance on low cost/ higher calorie foods)
- Labor saving devices (increased automobile use)
- Sedentary replacements for physical activity (computers, television, video games)

The decrease in physical activity is a major contributor to the childhood obesity epidemic. From 1980- 2000 among children aged 12-19, obesity has increased 10%, calorie consumption has increased 1%, but physical activity has declined by 13%. (Crespo, 2001). A study at Brigham and Women's Hospital of 10,000 9-14 year old children showed a larger increase in Body Mass Index in children who spent more time watching television and playing video games. (Proctor et al, 2003) Greater than two hours of daily television viewing can result in a 1 to 2 pound weight gain per year. (Proctor et al, 2003) These activities do not take place at school, but are more likely to occur at home.

Sugar and Obesity

No study has shown that drinking soft drinks causes obesity, although some studies do suggest an association between soft drink consumption and an increased risk for the development of obesity. The USDA CSFII study failed to demonstrate that the BMI of adolescents was associated with soft drink consumption (Forshee et al, 2003). A study of trends in children's beverage intake between 1977-1988 failed to show an increase in consumption over that time period (Park et al, 2002). Some experts have suggested that sugar is an appetite stimulant causing one to overeat. This theory has not held up as studies have demonstrated that sugar in solid or liquid form does not increase hunger or food consumption. (Anderson et al, 2003, Almiron-Roig et al, 2003). The 2005 Dietary Guidelines do allow for a percentage of daily discretionary calories from sugar in the form of solids or beverages.

There has been a great deal of blame being placed on high fructose corn syrup (HFCS), the primary sugar in fruit drinks and carbonated soft drinks. HFCS is very similar to table sugar or sucrose, and is digested and absorbed in an identical manner.

Some studies have suggested that fructose affects insulin levels, but HFCS is a combination of fructose and glucose, not just fructose alone.

Bone Health

Studies have shown that many children do not consume adequate levels of calcium, which can affect the health of both bones and teeth. The problem is related to inadequate intake of calcium containing foods rather than soft drink consumption. (Storey et al, 2004). Consumption of carbonated soft drinks has declined in children ages 1-5 while milk consumption has increased from 1987-1998 (Park, 2002). Flavored milks have increased in popularity, with an observed 7% increase in consumption among 13-17 year olds.

Calcium recommendations for children are currently 1200 mg/day. In addition to calcium, Vitamins D (from sunlight, milk, and other fortified foods) and K (dark green leafy vegetables) as well as the mineral phosphorus contribute to optimal bone health. Many children have inadequate Vitamin D intake as they do not spend enough time outside. Vegetables are not always part of the daily diet, so vitamin K intake is often inadequate. Physical activity is an essential component of strong bones.

Optimal bone health is more a matter of increasing the intake of calcium, Vitamin D, Vitamin K, phosphorus and exercise. There are several foods and beverages that contribute to improving bone health. It is important to note that carbonated beverages do not increase calcium excretion. (Heaney et al, 2001)

Dental health

Cavities are caused by 1) carbohydrate containing foods that act on bacteria in the saliva, and 2) the amount of time the carbohydrate is in the mouth. The incidence of dental caries has declined significantly due to fluoridated water and topical fluoride treatments in the dental office. In addition, regular brushing and dental check-ups have improved dental hygiene. (Touger-Decker et al, 2003, NIH, 2001).

Liquids such as sports drinks, juice, fruit drinks and carbonated soft drinks all have the same effect on the development of cavities and dental plaque. (DiMeglio, et al, 2000). Beverages do not stay in contact with the teeth as long as sugar or starch-containing foods, which must be chewed.

Childhood Diabetes

There are many factors that can contribute to the development of diabetes, but it is not caused by sugar intake. The American Dietetic Association states that sugar is not associated with increasing the risk of diabetes. (ADA, 2004). A higher proportion of sucrose relative to other carbohydrates does not increase the risk for the development of Type II diabetes. A diabetic child needs to learn how to eat well, for optimal growth and development as well as disease management. This can be accomplished with the inclusion of a controlled amount of sugar instead of elimination. If the diet is too restrictive, a diabetic child can feel deprived and compliance with the meal plan decreases. Weight loss, if overweight, and physical activity play a very important role in preventing diabetes and in diabetes management.

Hyperactivity

There are many anecdotal reports of the association between sugar consumption and hyperactivity. A review of all studies on this topic have shown no relationship between behavior and sugar intake. (Wolraich et al, 1995, Wolraich et al, 1994). There has been some interesting research on the role that particular fatty acids may play in managing attention deficit hyperactivity disorder, but there is no reason for sugar to be blamed as a causal factor.

The second concern is the correlation between caffeine and hyperactivity. Caffeine is a central nervous stimulant, and is not advised in large quantities. The amount of caffeine in carbonated soft drinks is small, ranging from 15 to 40 milligrams for an 8 ounce serving, or 20-50 milligrams for a 12 ounce bottle. Although caffeine is a stimulant, the effects are not greater in children than adults, and the amount of caffeine in soft drinks is not enough to cause nervousness or jitteriness in a child who may consume these beverages infrequently. (Hughes et al, 1998). Caffeine has no effect on children's behavior. (Schechter et al, 1995).

A far greater concern is the proliferation of "energy" drinks on the marketplace (of note, these are not sold in school vending machines) that have high levels of caffeine in herbal forms. These products are not recommended for children, yet, if there are no choices within the vending machines, some children may turn to these items as an alternative when they are off school grounds.

Hydration

Children must consume optimal levels of fluid for brain and body functioning. The child who is best hydrated will improve his/her concentration in the classroom. The child who has not had breakfast, or a beverage to start the day is already in a dehydrated state by the time he/she gets to school. This can result in thirst, headaches, mental fatigue and irritability.

For children who participate in school sports and/or after school sports, the need for fluid increases to help improve performance and prevent injury. Water alone may not be the best choice for active children, because it is not as preferred a beverage. A sports drink provides fluid and also the appropriate type and amount of carbohydrate and electrolytes for exercise. Overweight children can heat up faster, increasing the risk of injury, so adequate fluid intake is critical.

For all children, taste drives the beverage selections. Many children do not find water as appealing, as it is bland, and vegetable juice is not the beverage of choice. Some children and adolescents prefer the mouth feel of a carbonated beverage as one of the daily choices. The bottom line is that children must be well hydrated, and all types of beverages can be part of the hydration solution. Milk, water, juice, fruit drinks, tea, and soft drinks all provide equivalent amounts of fluid to the body.

Vending Machine Policies (Bans or Compromise)

The suggestion that the best course of action is to prohibit sales of certain beverages may have some negative consequences. If an item is forbidden, the desire for that item may increase, and consumption may increase as well. (Fisher et al, 1999). If there are no school vending machines, children may consume greater amounts of beverages at home or off school grounds. Vending machines may supplement the diet of children who have the early lunch period and get hungry before the school day is done. In addition, many children have after school activities so they cannot go home first for an after school snack before heading off to sports or a music lesson. A calorie-containing beverage such as juice, sports drinks, fruit drinks and soft drinks can provide some sustenance to get through the afternoon.

The Kansas Beverage Association is supportive of school and health initiatives regarding physical activity, balanced lifestyle and diet, personal responsibility, and choice. The industry cooperates with schools regarding the times of day that vending machines are available, and what products are offered. In addition, revenue generated from the sales can be used to meet that school's needs, but 66% of schools use this money to purchase physical education equipment.

With regards to beverage choices, the sales of water, diet soft drinks and sports drinks have increased, as has the sale of flavored milks. Variety is important to children, and sends a more positive message than restriction.

The food and beverage industry, government, community, schools and parents need to work together to improve children's health outcomes. The Kansas Beverage Association continues to be an advocate for personal choice and responsibility and is committed to the health and physical well-being of students. Revenues generated from vending machines offer programming opportunities in nutrition education and physical activity to schools that otherwise may not be able to fund these programs. There are abundant opportunities for partnering between local school districts and the Beverage outcome so that our children can attain health and fitness competence through Achievement, Balance and Choice.

REFERENCES

1. California Center for Public Health Advocacy. Overweight and unfit children in California Assembly Districts. Davis, CA 2002.
2. French Sa, Lin B-W, Guthrie JF. National trends in soft drink consumption among children and adolescents age 6 to 17 years: prevalence, amounts, sources, 1977-78 to 1994/98. J Am Diet Assoc. 2003; 103: 1326-1331.
3. Ginevan ME. Soft drinks and obesity. J Pediatr. 2004; 144(4): 555-6.

4. Ogden CL, Flegal KM, Carroll MD et al. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA* 2002; 288:1728-32.
5. Crespo CJ, Smit E, Troiano RP et al. "Television watching, energy intake, and obesity in US children: results from the Third National Health and Nutrition Examination Survey, 1988-1994." *Arch Pediatr. Adolesc Med.* 2001; 155: 360-5.
6. Proctor MH, Moore LL, Gao D, et al. Television viewing and change in body fat from preschool to early adolescence: The Framingham Children's Study. *Int J Obes Relat Metab Disord.* 2003 Jul; 27(7): 827-33.
7. Forshee Ra and Storey ML. Total beverage consumption and beverage choices among children and adolescents. *Int J Food Sci Nutr.* 2003. 54: 297-307.
8. Park YK, Meier ER, Bianchi P et al. Trends in children's consumption of beverages: 1987-1998. *Fam. Econ & Nutr Rev.* 2002 14: 69-79.
9. Anderson H and Woodend D. Consumption of sugars and the regulation of short term satiety and food intake. *Am J Clin Nutr.* 2003; 78 (suppl): 843S-9S
10. Almiron-Roig E, Chen Y and Drewnowski A. Liquid calories and the failure of satiety: how good is the evidence? *Obesity Reviews* 2003; 4: 201-212.
11. Storey ML, Forshee RA and Smith PA. Associations of adequate intake of calcium with diet, beverage consumption and demographic characteristics among children and adolescents. *J Am Coll Nutr.* 2004; 23 (1): 18-33.
12. Heaney RP and Rafferty K. Carbonated beverages and urinary calcium excretion. *Am J Clin Nutr.* 2001. 74: 343-7.
13. Touger-Decker R and van Loveren C. Sugars and dental caries. *Am J Clin Nutr.* 2003; 78 (suppl): 881S-92S.
14. NIH Consensus Development Conference Statement. Diagnosis and Management of Dental Caries throughout Life. March 2001.
15. DiMeglio D and Mattes R. Liquid versus solid carbohydrate: effects on food intake and body weight. *Int J Obes Relat Metab Disord.* 2000; 24:794-800.
16. Wolraich ML, Wilson DB, White JW. The effect of sugar on behavior or cognition in children; a meta analysis. *JAMA* 1995; 274:1617-21.
17. Wolraich ML, Lindgren SD, Stumbo PJ et al. Effects of diets high in sucrose or aspartame on the behavior and cognitive performance of children. *N Engl J Med.* 1994; 330: 301-17.
18. Hughes JR and Hale KL. Behavioral effects of caffeine and other methylxanthines on children. *Exp Clin Psychopharmacol* 1998; 6: 87-95

19. Schechter MD, Timmons GD. Objectively measured hyperactivity. Caffeine and amphetamine effects. *J Clin Pharmacol.* 1985; 23: 276-80.
20. Fisher Jo and Birch LL. Restricting access to palatable foods affects children's behavioral response, food selection and intake. *Am J Clin Nutr.* 1999; 69: 1264-72.