

United States Court of Appeals
For the Eighth Circuit

No. 15-1592

United States of America

Plaintiff - Appellee

v.

Earl James Ramos, also known as E.J.

Defendant - Appellant

No. 15-1602

United States of America

Plaintiff - Appellee

v.

Mary Ann Ramos

Defendant - Appellant

Appeals from United States District Court
for the Northern District of Iowa - Waterloo

Submitted: October 21, 2015
Filed: February 9, 2016

Before RILEY, Chief Judge, BRIGHT and GRUENDER, Circuit Judges.

GRUENDER, Circuit Judge.

Mary Ann Ramos and her son, Earl James Ramos, were convicted on several drug-distribution counts. Mary Ramos argues that the district court¹ erred by denying her motion for judgment of acquittal. Both defendants contend that the court improperly calculated their advisory sentencing guidelines range. We affirm.

I.

Mary Ramos managed an iWireless store in Cedar Rapids, Iowa. On May 28, 2013, two Drug Enforcement Administration (“DEA”) agents posed as customers and entered her store. When the agents asked Mary if she sold “potpourri,” Mary nodded and retrieved packets labeled “Mr. Happy” and “Mr. Nice Guy.” The agents selected cotton-candy-flavored “Mr. Nice Guy.” While walking to the register, Mary asked if the agents needed rolling papers. They declined and then paid \$26.75 for the 10.2 gram packet. Although the “Mr. Nice Guy” packet bore a label indicating that its contents were “100% Cannabinoid Free/DEA Compliant,” later testing at a DEA laboratory revealed that the packet contained organic plant material sprayed with the Schedule I controlled substance XLR-11, a synthetic cannabinoid.

¹The Honorable Linda R. Reade, Chief Judge, United States District Court for the Northern District of Iowa.

Several weeks later, a confidential informant working with the Tri-County Drug Enforcement Task Force called Mary and asked to meet at 9:50 p.m. When Mary asked what the caller was “trying to get,” the informant requested “Mr. Nice Guy” and “whatever jar you got.” Mary said that she had “Blue” but did not have “Mr. Nice Guy.” Mary instead offered the caller “Mr. Happy” and “Insane,” which were available in quantities of twelve and ten grams, respectively. The informant asked for “Mr. Happy,” and he stated that he wished to spend “around 80 or 90” on “the bath salt” and the “Mr. Happy.” Mary drove to meet the informant at a gas station in a nearby town and sold the informant one packet of “Mr. Happy” and one jar of “Blue” for a total of \$75. Mary did not charge the informant tax for the purchase nor did she later process the transaction through her register at the iWireless store. A later DEA test determined that the “Blue” weighed 0.2 grams and contained pyrrolidinopentiophene (α -PVP), a substance with a chemical structure substantially similar to the Schedule I controlled substance methylenedioxypropylone (“MDPV”) and with a pharmacological effect substantially similar to MDPV, cocaine, and methamphetamine.

Not long after these incidents, the DEA and Cedar Rapids police executed a search warrant at Mary’s store. The agents and officers recovered “Blue” from a drawer under the register counter. They also located hundreds of packets containing synthetic cannabinoids around the store, including in a drawer under the counter, a back storage room, and the back office. None of the synthetic cannabinoid products were advertised in the store. Nearly all of these products contained XLR-11, and some also contained UR-144, a second synthetic cannabinoid. Labels on many of these packets noted that the product should not be consumed by humans. The agents and officers also found smoking paraphernalia, including glass pipes and rolling papers. They found no loose tobacco in the store.

The DEA and Cedar Rapids police also searched Mary’s car and home. In the car, the agents and officers found an unloaded handgun and four boxes of ammunition

immediately next to a box containing several containers of “Blue.” They also found packets containing synthetic cannabinoids in the back pocket of the driver’s seat. In Mary’s home, the officers and agents found more synthetic cannabinoids and another box of “Blue.” The box’s label read “scouring powder” and bore the image of a silhouetted woman in front of a disco ball. Each jar of “Blue” contained between 0.2 and 0.4 grams of α -PVP.

Mary was indicted for several drug-related counts—including distribution of a controlled substance (XLR-11), *see* 21 U.S.C. § 841(a)(1), distribution of a controlled substance analogue (α -PVP), *see* 21 U.S.C. §§ 813, 841(a)(1), possession with intent to distribute a controlled substance (XLR-11), *see* 21 U.S.C. § 841(a)(1), possession with intent to distribute a controlled substance analogue (α -PVP), *see* 21 U.S.C. §§ 813, 841(a)(1)—and possession of a firearm in furtherance of a drug trafficking crime, *see* 18 U.S.C. § 924(c). At trial, the Government provided evidence regarding Mary’s encounters with the undercover officers and the confidential informant. The Government also called expert witnesses to testify regarding the synthetic cannabinoids and α -PVP. Another Government witness testified regarding the street names of the drugs at issue.

At the conclusion of the trial, the district court instructed the jury. Regarding the controlled substance counts for XLR-11, the court explained that the Government had to prove that Mary “knew that the substance was some kind of prohibited drug.” For the controlled substance analogue counts involving “Blue,” the court instructed the jury:

[T]he government must prove: (1) the defendant knew that Alpha-PVP was intended for human consumption; and (2) the defendant knew (a) the chemical structure of Alpha-PVP is substantially similar to the chemical structure of a controlled substance in Schedule I or II; and (b) Alpha-PVP either has or was represented by the defendant to have a stimulant, depressant or hallucinogenic effect on the central nervous

system that is substantially similar to or greater than the stimulant, depressant or hallucinogenic effect on the central nervous system as a controlled substance in Schedule I or II.

After the jury returned its guilty verdicts on the drug-related counts,² Mary renewed her motion for judgment of acquittal. She argued that the Government had failed to offer sufficient evidence regarding her knowledge. The district court denied this motion.

Earl Ramos managed the Five Star Snacks and Iowa Wireless store in Waterloo, Iowa. Beginning in 2012, Earl sold synthetic cannabinoids—including XLR-11, UR-144, AM-2201, and JWH-081—and synthetic cathinones from his store. Earl elected not to go to trial and instead pleaded guilty to one count of distributing pentedrone, a controlled substance analogue, *see* 21 U.S.C. § 841(a)(1). The court accepted his plea.

Before sentencing Mary and Earl, the district court conducted a joint evidentiary hearing on the nature of the various synthetic cannabinoids sold by the defendants. Synthetic cannabinoids are Schedule I substances; however, they are not listed in the Guidelines Manual drug-equivalency tables. The court thus sought to determine whether the synthetic cannabinoids were more closely related to pure tetrahydrocannabinol (“THC”) or marijuana, a plant that naturally contains THC. This decision guided the court’s conclusion about which marijuana-equivalency ratio to use when calculating the defendants’ base offense levels under the sentencing guidelines. USSG § 2D1.1 cmt. 6. If the synthetic cannabinoids were more closely related to THC, the Guidelines Manual dictated a 1:167 marijuana-equivalency ratio, meaning that one gram of the synthetic cannabinoid product would be treated as 167 grams of marijuana. USSG § 2D1.1 cmt. 8(D). In contrast, if marijuana were the more similar controlled substance, the applicable ratio would be 1:1. *Id.*

²The jury rendered a verdict of not guilty on the firearm count.

At the hearing, the Government called Dr. Jordan Trecki, a DEA pharmacologist, to testify regarding the pharmacological effect and potency of the synthetic cannabinoids. Dr. Trecki explained that each of the synthetic cannabinoids involved in the case has an effect on the central nervous system that is substantially similar to THC. He testified that all but two of the synthetic cannabinoids sold by the defendants are at least as potent as, if not more potent than, THC. Dr. Trecki also discussed the adverse side effects of various synthetic cannabinoids, including hallucinations, psychoses, severe agitation, and excited delirium. Finally, Dr. Trecki noted that synthetic cannabinoids are distinguishable from marijuana in several ways, including (1) the lack of a chemical moderating the effects of THC that is present in marijuana and (2) the synthetic drugs' increased likelihood of producing seizures, coma, and death. Based on this testimony, the court concluded that THC was the scheduled substance most closely related to the synthetic cannabinoids at issue. The court thus applied a 1:167 marijuana-equivalency ratio to determine the defendants' base offense levels and advisory sentencing guidelines ranges. The court ultimately sentenced Earl to 57 months' imprisonment, a sentence within his sentencing guidelines range, and Mary to 60 months' imprisonment, a downward variance from her advisory guidelines range of 97-121 months.

II.

The defendants raise several issues on appeal. Mary contends that the district court erred by denying her motion for judgment of acquittal because the evidence was insufficient to support her conviction. In addition, both Mary and Earl argue that the court improperly calculated their sentencing guidelines ranges based on the erroneous finding that THC was more closely related to the synthetic cannabinoids at issue.

A.

Our court reviews *de novo* the denial of a motion for judgment of acquittal. *United States v. Malloy*, 614 F.3d 852, 860 (8th Cir. 2010). “In doing so, we ‘view the evidence in the light most favorable to the government, resolving evidentiary conflicts in favor of the government, and accepting all reasonable inferences drawn from the evidence that support the jury’s verdict.’” *Id.* at 860-61 (alteration omitted) (quoting *United States v. Thomas*, 565 F.3d 438, 441 (8th Cir. 2009)). We reverse “only if no reasonable jury could have found the defendant guilty beyond a reasonable doubt.” *United States v. Brooks*, 715 F.3d 1069, 1081 (8th Cir. 2013) (quoting *United States v. Espinosa*, 585 F.3d 418, 423 (8th Cir. 2009)). Our court applies this strict standard “even when the conviction rests entirely on circumstantial evidence.” *United States v. Tillman*, 765 F.3d 831, 833 (8th Cir. 2014) (quoting *United States v. Worman*, 622 F.3d 969, 977 (8th Cir. 2010)).

Knowledge is one element of drug-distribution charges under 18 U.S.C. § 841(a). *See United States v. Nichols*, 808 F.2d 660, 663 (8th Cir. 1987). Mary contends on appeal that the Government failed to prove that she knew the synthetic cannabinoid products contained XLR-11 or some other controlled substance. The Government, however, was “not required to prove that the defendant actually knew the exact nature of the substance with which [s]he was dealing.” *United States v. Sheppard*, 219 F.3d 766, 769 (8th Cir. 2000) (quoting *United States v. Jewell*, 532 F.3d 697, 698 (9th Cir. 1976) (en banc)). “[T]he ‘knowingly’ element of th[e] offense refers to a general criminal intent, i.e., awareness that the substance possessed was a controlled substance of some kind.” *United States v. Noibi*, 780 F.2d 1419, 1421 (8th Cir. 1986). “Since the factfinder can seldom know with certainty what someone actually knows, knowledge must necessarily be shown circumstantially.” *Id.*

During trial, the Government presented evidence tending to show that Mary knew she was dealing with illegal drugs when she sold the XLR-11. Though Mary

openly sold glass pipes and other smoking paraphernalia, the packets containing synthetic cannabinoid products were not on public display in the store nor advertised in any way. One undercover officer who took part in the controlled purchase testified that Mary produced packets of “Mr. Happy” and “Mr. Nice Guy” only after the agent requested “potpourri,” a street name for synthetic cannabinoid products. The label on the packets of “Mr. Happy” and “Mr. Nice Guy” stated that the product was not for human consumption; however, the “Mr. Nice Guy” packet advertised a cotton-candy flavor. And Mary, unprompted, asked if the officers needed rolling papers with the “Mr. Nice Guy” purchase. After the agents declined, Mary charged \$25 for the small, ten-gram packet of purported “potpourri.” Finally, the jury heard that the search of Mary’s store, car, and home yielded hundreds of packets containing synthetic cannabinoids stored out of public view. Viewed in the light most favorable to the jury’s verdict, this evidence was sufficient to demonstrate Mary’s awareness that she possessed and sold a controlled substance of some kind.

Mary also contends that the Government failed to meet its burden to prove her knowledge with respect to α -PVP, the controlled substance analogue in “Blue.” She argues that the jury instructions created a heightened knowledge requirement and that her conviction cannot stand because the Government failed to meet its resultant burden. As an initial matter, Mary is incorrect in her assertion that we should assess sufficiency under the instructions given to the jury. The Supreme Court recently held that “a sufficiency challenge should be assessed against the elements of the charged crime, not against the erroneously heightened jury instructions.” *Musacchio v. United States*, 577 U.S. ---, No. 14-1095, slip op. at 4 (U.S. Jan. 25, 2016). In any event, it is not clear that the instructions in the present case laid out a heightened knowledge element; instead, they described one of two possible methods of proving knowledge in analogue cases.

The Supreme Court clarified the two ways the Government may prove knowledge in analogue cases last term in *McFadden v. United States*, 576 U.S. ---,

135 S. Ct. 2298 (2015). The Court explained that the Government either must (1) show the defendant knew she was dealing with some controlled substance, regardless of whether she knew the identity of the substance, *or* (2) show that the defendant knew the specific features of the substance that make it a controlled substance analogue. *Id.* at 2302. These features include (a) having a “chemical structure . . . which is substantially similar to the chemical structure of a controlled substance in schedule I or II” and (b) having “a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than’ the effect of a controlled substance in schedule I or II . . . or . . . is represented or intended to have that effect with respect to a particular person.” *Id.* at 2305 (quoting 21 U.S.C. § 802(32)(A)). Such knowledge suffices because “[a] defendant who possesses a substance with knowledge of those features knows all of the facts that make his conduct illegal, just as a defendant who knows he possesses heroin knows all of the facts that make his conduct illegal.” *Id.*

The court’s instructions at Mary’s trial closely matched the second method of proving knowledge under *McFadden*.³ The court instructed the jury that the Government had to prove (1) that Mary knew that α -PVP was intended for human consumption⁴ and (2) that she knew (a) that the chemical structure of α -PVP is substantially similar to the chemical structure of a controlled substance in Schedule I or II and (b) that α -PVP either has or was represented by Mary to have a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially

³Though our analysis focuses on sufficiency under the second method of proving knowledge outlined in *McFadden*, we do not rule out the possibility that a reviewing court could affirm on the alternative basis that the evidence was sufficient under the first method: that Mary knew she was dealing with some controlled substance. *See Musacchio*, slip op. at 6 (“A reviewing court’s limited determination on sufficiency review thus does not rest on how the jury was instructed.”). However, because we need not answer the question at this time, we refrain from doing so.

⁴This requirement comes from 21 U.S.C. § 813.

similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system as a controlled substance in Schedule I or II.⁵

Mary contends that the Government did not prove the knowledge element of the charged crime because the Government failed to offer direct evidence regarding her knowledge of the chemical structure and pharmacological effects of α -PVP.⁶ However, as with prosecutions involving substances listed on the drug schedules, the Government did not need to present direct evidence of Mary's knowledge of the analogue's nature and effects. Instead, the Government could satisfy its burden through circumstantial evidence of knowledge. *See United States v. Carlson*, --- F.3d ---, No. 14-2986, 2016 WL 158036, at *4 (8th Cir. Jan. 14, 2016). Examples of such circumstantial evidence in analogue cases include "a defendant's concealment of his activities, evasive behavior with respect to law enforcement, knowledge that a particular substance produces a 'high' similar to that produced by controlled substances, and knowledge that a particular substance is subject to seizure at customs." *McFadden*, 135 S. Ct. at 2304 n.1.

Judged under this standard, the evidence was sufficient to show that Mary knew the specific features of α -PVP that make it a controlled substance. First, the

⁵Like the Supreme Court in *McFadden*, we do not decide whether the Government had to prove both (a) and (b). 135 S. Ct. at 2305 n.2. We merely assume for the sake of argument that the Government had to prove both.

⁶On appeal, Mary does not raise any argument specifically challenging the Government's evidence that she knew the product was intended for human consumption. Even if she had raised this challenge, however, we would reject it in light of the evidence offered at trial. *See United States v. Sullivan*, 714 F.3d 1104, 1108 (8th Cir. 2013) (affirming a conviction for distributing a controlled substance analogue, even though the label on the analogue said not to ingest it, because other evidence supported the conclusion that the defendant intended the analogue for human consumption).

evidence suggested that she knew she was in possession of an analogue to a controlled substance with a chemical structure similar to a drug listed on the federal drug schedules. The jury heard a recorded conversation in which the confidential informant expressed his desire to buy bath salts. A Government witness at trial explained that this term is a street name for “generic forms of meth or cocaine.” And the evidence makes clear that Mary understood this meaning. *Cf. Sullivan*, 714 F.3d at 1107 (concluding that a defendant’s knowledge that “bath powder” was illegal supported a reasonable inference that he knew powder he possessed and described as “bath powder” contained a controlled substance analogue); *Carlson*, 2016 WL 158036, at *4 (noting that knowledge of an analogue’s effects may be probative of the defendant’s knowledge of chemical structure). The cloak-and-dagger nature of the transaction with the confidential informant evidenced an attempt to conceal the sale. The jury heard that Mary met the confidential informant to conduct the sale at a gas station just before 10:00 p.m. Mary did not charge tax or provide a receipt for the purchase, nor did she later process the transaction through her register at the iWireless store. In addition, though the jars of “Blue” recovered in this case were labeled “scouring powder,” the jury heard that Mary charged the informant \$50 for 0.2 grams. This price far exceeds the cost of comparable cleaning products; indeed, a Government witness testified that twenty to twenty-four ounces—roughly 567-680 grams—of Comet or a similar powder would cost less than a dollar.

Second, the circumstantial evidence supported the inference that Mary understood the pharmacological effects of “Blue,” specifically that it produced a high similar to a controlled drug. The boxes of “Blue” in Mary’s possession bore an image of a silhouetted woman in front of a disco ball, suggesting the substance’s use as a party drug. During the transaction, the informant explained to Mary that he had been visiting another location to make similar purchases multiple times per day. Finally, Mary stated that the informant would be “real happy” following the late-night transaction. Viewed in the light most favorable to the verdict, this evidence allowed the jury to infer Mary’s knowledge of the specific features of the substance that make

it a controlled substance analogue, that is, its use, chemical nature, and pharmacological effects. Accordingly, the evidence was sufficient under the second method of proving knowledge outlined in *McFadden*. We thus affirm the district court's denial of the motion for judgment of acquittal.

B.

Mary and Earl Ramos also appeal the calculation of their advisory sentencing guidelines ranges, arguing that the district court improperly determined their base offense levels when it found that the synthetic cannabinoids sold by the Ramoses were more like pure THC than an equal quantity of marijuana. We join our sister circuits in treating this similar-substance question as a factual determination. *See United States v. Malone*, 809 F.3d 251, 257 (5th Cir. 2015); *United States v Brey*, No. 15-10165, 2015 WL 5521181, at *4 (11th Cir. Sept. 21, 2015) (unpublished); *United States v. Beckley*, 515 Fed. App'x 373, 375 (6th Cir. 2013) (unpublished); *United States v. Chowdhury*, 639 F.3d 583, 585 (2d Cir. 2011). We thus review for clear error. *See United States v. Stanley*, 362 F.3d 509, 511 (8th Cir. 2004).

The synthetic cannabinoids at issue in this case, such as XLR-11, are Schedule I controlled substances, *see* 21 U.S.C § 812 Schedule I (d); however, they are not referenced in the guidelines drug-equivalency tables. In cases involving controlled substances not specifically referenced in the guidelines, the district court must use the marijuana-equivalency ratio for the most closely related controlled substance found in the drug-equivalency tables. USSG § 2D1.1, cmt. 6. To identify the most closely related substance, the court must consider, to the extent practicable, three factors:

(A) Whether the controlled substance not referenced in this guideline has a chemical structure that is substantially similar to a controlled substance referenced in this guideline.

(B) Whether the controlled substance not referenced in this guideline has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance referenced in this guideline.

(C) Whether a lesser or greater quantity of the controlled substance not referenced in this guideline is needed to produce a substantially similar effect on the central nervous system as a controlled substance referenced in this guideline.

USSG § 2D1.1, cmt. 6. The parties acknowledge that the first factor did not aid the district court's analysis; synthetic cannabinoids do not have a chemical structure similar to either THC or marijuana. Accordingly, our review focuses on the district court's findings with respect to factors B and C.

During the evidentiary hearing, Dr. Trecki testified in detail about facts relevant to factor B. He explained that the synthetic cannabinoids affect the central nervous system in a manner substantially similar to THC. Dr. Trecki testified to the synthetic cannabinoids' euphoric effect and their potential to cause hallucinations, psychoses, and severe agitation. He also noted that both the synthetic cannabinoids and THC cause heart palpitations and reddening of the conjunctiva. Although Dr. Trecki noted that marijuana also produces some of these effects because marijuana contains THC, he explained that marijuana plants also contain a moderating chemical, cannabidiol, that mediates THC's effects and reduces euphoria. Finally, Dr. Trecki explained that synthetic cannabinoids carry risks that are "very uncommon for marijuana," including seizures, coma, and death.

Dr. Trecki also provided testimony relevant to the district court's analysis under factor C. He explained that equal amounts of pure synthetic cannabinoids and pure THC produce similar effects on the central nervous system. Indeed, discrimination studies showed that animals could not differentiate between XLR-11,

one of the synthetic cannabinoids, and THC. He further explained that many of the synthetic cannabinoids sold by the Ramoses were more potent than THC. When asked about the medium bearing the synthetic cannabinoids in the Ramoses' cases—i.e., the potpourri—Dr. Trecki noted that spraying synthetic cannabinoids on organic plant material would not change the active substance's nature, character, or potency. The process simply would dilute the synthetic cannabinoids over a greater volume of material. In light of this testimony, the court concluded that THC was the most similar substance to the synthetic cannabinoids sold by the defendants. Accordingly, the court calculated the base offense levels using a 1:167 marijuana-equivalency ratio provided for THC. *See* USSG § 2D1.1 n.8(D). We see no clear error in the court's determination. *See Malone*, 809 F.3d at 258 (affirming the district court's conclusion that AM-2201, a synthetic cannabinoid, was most closely related to pure THC); *cf. Carlson*, 2016 WL 158036, at *8 (rejecting the defendant's legal challenge to the application of a 1:167 marijuana-equivalency ratio for synthetic cannabinoids, such as XLR-11, UR-144, and AM-2201).

The dissent disagrees with this conclusion and instead adopts the Ramoses' position that the district court improperly applied factor C. The dissent contends that the court should have examined the effects of "synthetic cannabinoid potpourri," the mixture of inert plant material and synthetic cannabinoids, rather than pure synthetic cannabinoids alone. *Infra* 18. However, this argument runs afoul of the plain text of the Guidelines Manual. When cases involve controlled substances not specifically referenced in the drug-equivalency tables, Comment 6 to § 2D1.1 tells the court to compare "*the controlled substance[s]* not referenced in th[e] guideline" to the substances listed in the drug-equivalency tables. Here, the record makes clear that "the controlled substance[s]" at issue were the synthetic cannabinoids. The term "controlled substance" is defined by statute as "a drug or other substance, or immediate precursor, included in schedule I, II, III, IV, or V." 21 U.S.C. § 802 (6). And while synthetic cannabinoids, such as XLR-11, are listed in Schedule I, *see* 21 U.S.C § 812 Schedule I (d), "synthetic cannabinoid potpourri" is not independently

listed on any drug schedule. Mary was found guilty of distributing the Schedule I controlled substance XLR-11. Earl's plea agreement identified the Schedule I substances at issue as the synthetic cannabinoids. In light of these facts, we conclude that the district court properly applied the plain language of factor C when it compared only the effect of "the controlled substances"—the synthetic cannabinoids—to the substances listed in the drug-equivalency tables. *See United States v. Figueroa*, 647 F.3d 466, 470 (2d Cir. 2011) (remanding for reconsideration when the district court failed to apply the three-factor test from § 2D1.1 and instead relied on the synthetic drug's street-use counterpart to determine the most closely related listed substance).⁴

With this principle in mind, the Ramoses' arguments challenging the district court's base offense level calculations lack merit. After identifying THC as the most similar substance, the court correctly calculated the Ramoses' base offense levels using the entire weight of the substances containing the synthetic cannabinoids. Application Note A to § 2D1.1 states: "Unless otherwise specified, the weight of a controlled substance set forth in the table refers to the *entire weight of any mixture* or substance containing a detectable amount of the controlled substance." Stated another way, "drug quantity under the guidelines includes the entire weight or volume of any mixture containing a detectable amount of controlled substance, without regard

⁴Though we conclude that the Guideline Manual text sufficiently rebuts the dissent's position, we note our additional concern with the dissent's suggestion that the presence of plant material is the key difference between marijuana and THC. Dr. Trecki testified that marijuana plants contain cannabidiol, a moderating chemical that reduces the potency of the already-lower concentration of THC naturally present in the plant. Nothing in the record suggests that the synthetic cannabinoids nor the inert plant material onto which they were sprayed contain cannabidiol or any comparable chemical. Indeed, Dr. Trecki stated that spraying the synthetic cannabinoids onto the inert material did not change their nature or character. In light of such evidence, we see no reason to ignore the Guidelines Manual's plain instruction to focus on the controlled substance alone.

to purity or concentration.” *United States v. Stewart*, 761 F.3d 993, 1001 (9th Cir. 2014). Only if a user must separate the other materials from the controlled substance prior to use should the court calculate the drug quantity without including this weight. USSG § 2D1.1 cmt. 1.⁵ And only if the Guidelines Manual carves out an express exception does the mixture-or-substance rule not apply. *See, e.g.*, § 2D1.1 & n.(B), (G); *see also United States v. Shabazz*, 933 F.2d 1029, 1032 (D.C. Cir. 1991). Here, the controlled substances were sold in the form of a mixture: synthetic cannabinoids sprayed onto inert plant material. *See Chapman v. United States*, 500 U.S. 453, 461-62 (1991) (discussing mixtures). This plant material was not removed prior to the drug’s use, nor was it easily separable. Likewise, synthetic cannabinoids are not among the listed exceptions to the mixture-or-substance rule. Accordingly, the district court properly found that the weight of the mixture dictated the drug-quantity weight at sentencing.

In sum, because the court correctly applied the guidelines and because Dr. Trecki’s testimony supported the court’s factual conclusion that THC was the most similar substance to the synthetic cannabinoids at issue, we find no clear error in the application of the 1:167 marijuana-equivalency ratio and, therefore, the determination of the Ramoses’ base offense levels. In the absence of any other challenges, we uphold the Ramoses’ sentences.

BRIGHT, Circuit Judge, concurring in part and dissenting in part.

I agree sufficient evidence supported the verdict against Mary Ramos and, therefore, I concur with the majority’s holding that the district court properly denied Mary Ramos’ motion for judgment of acquittal. However, I dissent with respect to

⁵Examples of such separable substances listed in the Guidelines include “fiberglass in a cocaine/fiberglass bonded suitcase, beeswax in a cocaine/beeswax statue, and waste water from an illicit laboratory used to manufacture a controlled substance.” USSG § 2D1.1 n.1.

the sentence imposed upon both Mary and Earl Ramos (the “Ramoses”). Specifically, I disagree with the majority’s conclusion that the sentencing judge properly applied a marijuana equivalency ratio of 1:167 after finding the synthetic cannabinoid sprayed onto plant material (“synthetic cannabinoid potpourri”) was most analogous to pure Tetrahydrocannabinol (“THC”) under Application Note 6 of U.S. Sentencing Guidelines Manual (U.S.S.G.) § 2D1.1.

THC is a psychoactive ingredient that causes a euphoric state by binding to cannabinoid receptors in the brain. The MERCK Manual of Diagnosis and Therapy 1525-26 (Robert S. Porter et al. eds., 19th ed. 2011). THC is “naturally contained in a plant of the genus *Cannabis* . . . or in the resinous extractives of such plant.” 21 C.F.R. § 1308.11(d)(31). Thus, THC is not only a Schedule I controlled substance, but also the psychoactive ingredient in a number of Schedule I controlled substances under the Guidelines.

The marijuana equivalency table in Application Note 8(D) to U.S.S.G. § 2D1.1 lists several distinct Schedule I controlled substances where THC is the psychoactive ingredient. Importantly, each of the controlled substances in Application Note 8(D)—other than pure forms of THC—may contain some amount of plant material. Compare 21 U.S.C. § 802(16) (defining *marihuana* as “all parts of the plant *Cannabis sativa* L.”), with U.S.S.G. § 2D1.1(c), Drug Quantity Table n.H (defining *hashish* as containing both THC and “fragments of plant material”—in addition to other ingredients), with id., n.I (defining *hashish oil* as containing THC, other ingredients, and “essentially free of plant material (e.g. plant fragments)”). Interestingly, as the chart below illustrates, the marijuana equivalency ratio under Application Note 8(D) increases as the amount of plant material decreases:

Controlled Substance	Ratio	Amount of Plant Material
Marihuana/Cannabis	1:1	“[A]ll parts of the plant Cannabis sativa L.” 21 U.S.C. § 802(16).
Cannabis Resin or Hashish	1:5	Contains “fragments of plant material.” U.S.S.G. § 2D1.1(c), Drug Quantity Table n.H.
Hashish Oil	1:50	Must be “essentially free of plant material.” U.S.S.G. § 2D1.1(c), Drug Quantity Table n.I.
THC, Organic or Synthetic	1:167	Contains no plant material.

Thus, under the Guidelines, the marijuana equivalency ratio applied to THC-based controlled substances is highly dependent on the amount of plant material—likely because the concentration of THC increases with the extraction of plant material. See, e.g., Wayne Hall et al., Cannabinoids and Cancer: Causation, Remediation, and Palliation, 6 *Lancet Oncology* 35, 35 (2005) (noting the increase in THC concentration between marijuana (0.5% to 5%), hashish (2% to 8%), and hashish oil (15% to 20%)).

Here, because synthetic cannabinoid potpourri is not “specifically referenced” in the Guidelines, the Guidelines required the sentencing judge to determine the Guideline analogue. U.S.S.G. § 2D1.1 cmt. n.6. To do so, the Guidelines charged the sentencing judge to “determine the base offense level using the marijuana equivalency of the most closely related controlled substance”—including THC-based controlled substances containing plant material. Id. (emphasis added). At issue is whether the record supported a finding that the synthetic cannabinoid potpourri was “most closely related” to pure THC rather than any of the other controlled substances that contain both THC and plant material. See id.

To determine the “most closely related controlled substance,” Application Note 6 requires the sentencing judge to consider, among other things, “[w]hether a lesser or greater quantity of the controlled substance not referenced in this guideline is needed to produce a substantially similar effect on the central nervous system as a controlled substance referenced in this guideline.” *Id.*, cmt. n.6(c) (emphasis added) (hereinafter, “Factor C”). The parties do not dispute that, when analyzing Factor C, the government’s expert analyzed only the effect of pure synthetic cannabinoids on the central nervous system, not the effect of the synthetic cannabinoid potpourri.⁶

Here, an expert determined, and the sentencing judge found, that pure THC is the most equivalent controlled substance to the pure form of the synthetic cannabinoids. In light of the THC finding, the analysis cannot end because THC is the psychoactive ingredient in a number of distinct controlled substances under the Guidelines. Thus, when an expert determines pure THC is the most analogous controlled substance to a pure synthetic cannabinoid, Factor C requires the sentencing judge to determine which THC-based controlled substance “produce[s] a substantially similar effect on the central nervous system.” U.S.S.G. § 2D1.1 cmt. n.6(c). Factor C does not permit the sentencing judge to disregard controlled substances that are, by their very nature, mixtures. *See id.* (requiring the sentencing judge to consider all “controlled substance[s] referenced in this guideline”).

⁶The majority relies on the testimony of government expert Dr. Jordan Trecki to support the district court’s factual finding that the synthetic cannabinoids produce the most similar effect on the central nervous system as pure THC. (Maj. Op. 13-14). But Dr. Trecki admitted at the evidentiary hearing that he did not analyze the synthetic cannabinoid potpourri to determine what, if any, effect the plant material had on the potency of the synthetic cannabinoid. In the absence of this testing, Dr. Trecki lacked the scientific data to support his conclusion that the “organic plant material would not change the active substance’s . . . potency.” (*Id.* at 14).

As highlighted above, the main distinction between the THC-based controlled substances is the amount of plant material, see 21 U.S.C. § 802(16); U.S.S.G. § 2D1.1(c), Drug Quantity Table n.H; id., n.I, likely because a decrease in plant material generally means an increase in THC concentration, see Hall et al., supra, at 35. Therefore, the only way to determine which THC-based controlled substance “produce[s] a substantially similar effect on the central nervous system,” is to consider the presence of plant material. To do otherwise would be contrary to the plain language of Application Note 6—requiring consideration of all “controlled substance[s] referenced in [the] guideline”—because a sentencing judge would be permitted, if not required, to disregard all THC-based controlled substances that contain plant material.⁷

Therefore, because: (1) THC is both a controlled substance and a psychoactive ingredient in other controlled substances under the Guidelines; (2) the main distinguishing factor between the THC-based controlled substances is the amount of plant material; (3) the Guidelines require consideration of all “controlled substance[s] referenced in [the] guideline” to determine the effect an analogue has on the central nervous system; and (4) the only way to distinguish between the THC-based controlled substances is to determine the effect the plant material has on the synthetic cannabinoid concentration, I would hold the sentencing judge erred in finding the synthetic cannabinoid potpourri was most similar to pure THC. The record is devoid of any evidence regarding the effect the synthetic cannabinoid potpourri had on the central nervous system and, in the absence of that evidence, there was no record to support the sentencing judge’s application of the 1:167 ratio.

⁷Further, imposition of a 1:167 ratio for possession and distribution of synthetic cannabinoid potpourri results in an extreme increase in base offense level in comparison to any of the other THC-based controlled substances’ marijuana equivalency ratios.

The majority, however, contends the sentencing judge correctly applied Factor C when it considered only the effect of the synthetic cannabinoids.⁸ (Maj. Op. 14-15). The majority concludes the plant material should not be considered in conjunction with “synthetic cannabinoids, such as XLR-11, [because synthetic cannabinoids] are listed in Schedule I . . . [not] ‘synthetic cannabinoid potpourri.’ ” (Id. at 14).⁹ To support this interpretation, the majority relies upon three words in Factor C—“the controlled substance.” (Id.)

But by limiting its interpretation to three words in Factor C, the majority fails to take into account “the language and design of the [Guidelines] as a whole.” United States v. Bruguier, 735 F.3d 754, 765 (8th Cir. 2013) (en banc) (Riley, C.J., concurring) (quoting K Mart Corp. v. Cartier, Inc., 486 U.S. 281, 291, 108 S. Ct. 1811, 100 L. Ed. 2d 313 (1988)); see also United States v. Godsey, 690 F.3d 906, 910 (8th Cir. 2012) (quoting United States v. Davis, 668 F.3d 576, 577 (8th Cir. 2012) (“We employ basic rules of statutory construction when interpreting the Guidelines.”)). In the context of Factor C, Application Note 6 plainly calls for the consideration of plant material when assessing which THC-based controlled

⁸Notably, as late as 2011, the Drug Enforcement Administration’s (“DEA”) guidance indicated synthetic cannabinoid potpourri had the most “similar effect[]” to marijuana—a “mixture.” U.S. Dep’t of Justice, Drug Enf’t Admin., Drugs of Abuse 62 (2011). Based upon the DEA’s 2011 understanding of synthetic cannabinoid potpourri, “[t]he conversion ratio of synthetic drugs to marijuana [was] 1:1.” Jeffrey C. Grass, McFadden v. United States: Deconstructing Synthetic Drug Prosecutions, 39 Champion 34, 40-42 (2015). Not until recently did the DEA begin to assert that synthetic cannabinoids “are most similar to . . . THC” under the marijuana equivalency table. Id. Consequently, the government’s argument and the majority’s holding undermines the prior position of the DEA that the plant material associated with synthetic cannabinoid potpourri should be considered when analyzing a THC analogues’ effect on the central nervous system.

⁹At the time of the Ramoses’ convictions, the DEA had temporarily listed XLR-11 as a Schedule I controlled substance pursuant to 21 C.F.R. § 1308.11(h)(2).

substance is “most closely related” to a THC analogue. This is required specifically because THC is treated differently than other controlled substances in the Guidelines—namely THC is both a controlled substance and the psychoactive ingredient in other controlled substances. Consequently, the majority’s analysis leads to the unreasonable result that the “most closely related controlled substance” can never be marijuana, hashish, or hashish oil because it is improper to consider the presence of plant material when analyzing THC analogues. In my view, the majority’s conclusion is contrary to the plain language of Application Note 6 and the treatment of THC in Guidelines.¹⁰ Dolan v. U.S. Postal Serv., 546 U.S. 481, 486, 126 S. Ct. 1252, 163 L. Ed. 2d 1079 (2006) (“The definition of words in isolation, however, is not necessarily controlling in statutory construction. A word in a statute may or may not extend to the outer limits of its definitional possibilities. Interpretation of a word or phrase depends upon reading the whole statutory text, considering the purpose and context of the statute, and consulting any precedents or authorities that inform the analysis.”).

For these reasons, I would reverse the Ramoses’ sentences and remand for resentencing consistent with this opinion.¹¹ Because the government failed to present evidence on the actual effect the synthetic cannabinoid potpourri had on the central

¹⁰The majority also concludes the sentencing judge did not err in using the weight of the entire seized substance to determine the Ramoses’ base offense level. (Maj. Op. 15-16). I agree. I disagree with the majority only to the extent the sentencing judge erred in its identification of THC as the most similar substance. Had the sentencing judge taken into account the plant material in determining the THC-based analogue to synthetic cannabinoid potpourri, the proper weight of the substance would be “the entire weight of [the] mixture . . . containing a detectable amount of the controlled substance.” U.S.S.G. § 2D1.1(c), Drug Quantity Table n.A.

¹¹I acknowledge this Court recently affirmed the application of a 1:167 ratio in a case regarding synthetic cannabinoids on other grounds. United States v. Carlson, Nos. 14-2986 et al., – F.3d –, 2016 WL 158036, at *8 (8th Cir. Jan. 14, 2016).

nervous system, the district court should be limited to the current evidentiary record and the sentencing judge should impose a marijuana equivalency ratio of 1:1, United States v. Thomas, 630 F.3d 1055, 1057 (8th Cir. 2011) (per curiam) (“ ‘[L]imiting the Government to one bite at the apple’ ” (quoting United States v. King, 598 F.3d 1043, 1050 (8th Cir. 2010))),¹² as it was the ratio applied prior to the government’s recent position that the 1:167 ratio is appropriate in cases regarding synthetic cannabinoid potpourri, U.S. Dep’t of Justice, supra, at 62; see also Grass, supra, at 40-42.

III.

For the foregoing reasons, we affirm Mary’s conviction and sentence and Earl’s sentence.

¹²I would conclude the government is bound by the current evidentiary record upon resentencing, but acknowledge that in some instances this Court has permitted the sentencing judge to hear additional evidence. See, e.g., United States v. Dawn, 685 F.3d 790, 798-800 (8th Cir. 2012); United States v. Williams, 627 F.3d 324, 329 (8th Cir. 2010). However, no such request has been made in this case.